PUBLIC LIBRARY
MAR - 9 1943
DETROIT

FOOD INDUSTRIES

• FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

MARCH 1943

How Potato Shreds Are Dehydrated

Choosing Floors For Food Plants

Bacteria Control In Meat Mixtures

Salvage—a Duty And Good Business

Method of Closing Bags Saves Metal

Quality, Profit In Cup Cakes

McGRAW-HILL PUBLICATION

MOISTURE
meets its master!

Moisture...arch-enemy of so many products susceptible to damage by dampness...has no effect on the contents of these kraft paper bags made by Union Bag & Paper Corporation. Their multi-wall construction includes a vapor barrier that is one of the wonders of modern packaging.

Moisture resistance is just an example of the virtues that Union Bag can build into paper packages and containers through Scutan, its special moisture-barrier, water-proofed sheet.

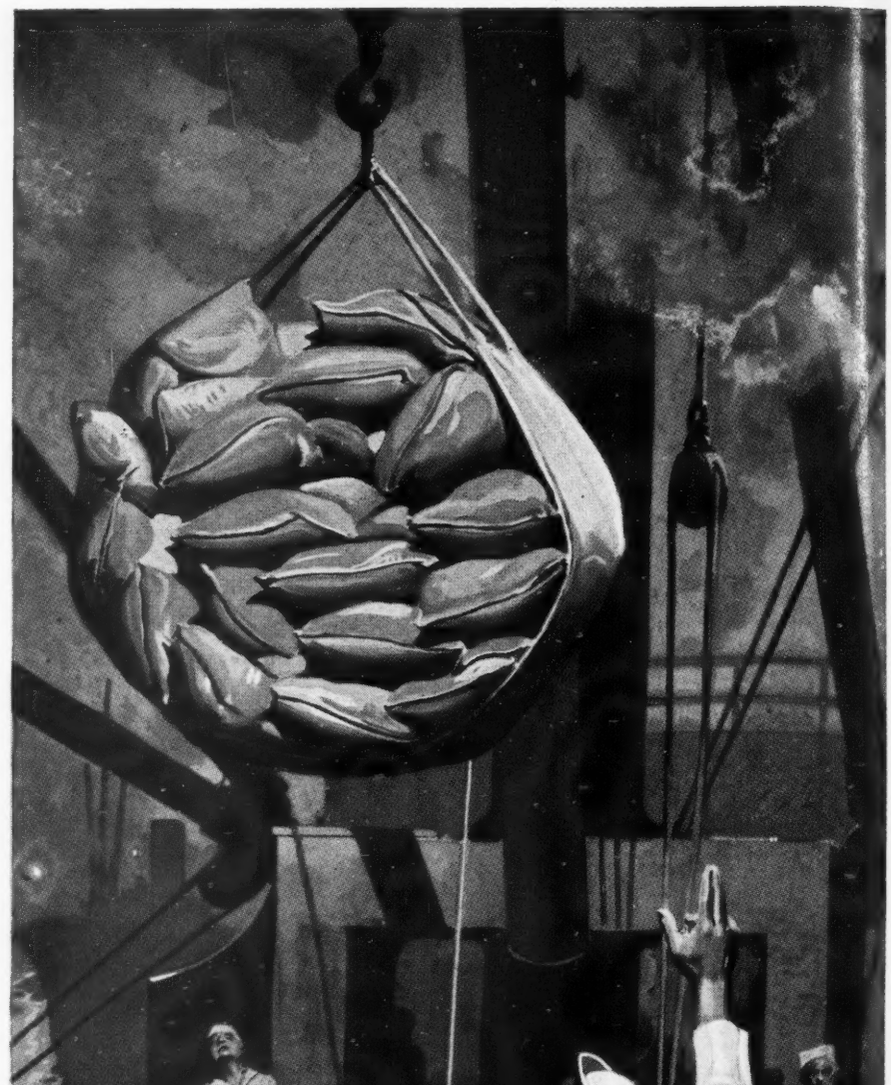
Today, kraft from the South's vast supply of pulpwood is successfully replacing metal, burlap and other scarce materials...meeting specific demands of packaging and shipping in numerous industries...serving, and serving well, in thousands of important tasks.

MULTI-WALL BAG CONSTRUCTION:
Union Bag & Paper Corp. offers highly efficient methods of packaging and shipping agricultural, chemical, fertilizer, food, rock products...affords a decided weight- and space-saving advantage.

IN THE FIELD OF WAR PACKAGING:
Union Bag & Paper Corp. is able to make bags from its wide variety of kraft papers, including those resistant to oil, grease and water, super-strong, non-scuff, flavor-sealing, fold-enduring, and eye-appealing...is able to make kraft containers that have one, or ALL of these important advantages.

Whatever your wartime container or package problem... no matter how difficult it may seem...consult

UNION BAG & PAPER CORP.
WOOLWORTH BUILDING, NEW YORK, N. Y.



KRAFT PAPER—THE SERVICE UNIFORM OF AMERICAN PRODUCTS

MARCH FOOD TECHNOLOGY

DEHYDRATED FOODS
Army Specifications for Dehydrated Foods 52
How Potato Shreds Are Made..... 47
Peroxidase Test for Blanching Requires Careful Application 50

MEAT
Control of Thermophilic Bacteria in Canned Meat Mixtures..... 66

VITAMINS
Thiamin and Riboflavin in Wheat Germ.. 119

FATS AND OILS
Stabilization of Fats 119

DAIRY PRODUCTS
Canned and Powdered Milk..... 119
Further Studies on Oxidized Flavor..... 119

BACTERIOLOGY
Bacteriological Study of Apple Juice..... 119
Fumigation of Fungi and Bacteria..... 120

SUGAR
Sugar Mixture 120

ENGINEERING
Choose Floors That Withstand Conditions of Processing 58

BAKING
Quality and Profit in a Nickel's Worth of Cup Cakes..... 68

QUALITY CONTROL
Brief Summaries of Grade Standards..... 72

FROZEN FOODS
Glazing in Quick Freezing.....120

CEREAL PRODUCTS
Bulk Storage and Blending Aid Quality, Price Control 70
Effect of Storage on Corn Proteins..... 121

MISCELLANEOUS
Monosodium Glutamate 121

THE COVER

Army cook and mess sergeant empty 5-gal. can of dehydrated carrots into steam-jacketed cooking kettle. Army cooks are taught to conserve vitamins, minerals and flavor by using just the right amount of water for rehydration and by cooking for only a short time. (USDA Photo by Knell.)

EVERY MONTH

Talk of the Industry..... 43
Automotive 64
New Packages and Products..... 74
The Food Industry News..... 79
Men, Jobs and Companies..... 95
Food Equipment News..... 99
Questions and Answers..... 105
Just Off the Press..... 107
Books 108
Letter to the Editor..... 109
Patents 111
Food Technology—Abstracts 119
Formulas 123

FOOD INDUSTRIES

M. A. WILLIAMSON, *Publisher*
LAURENCE V. BURTON, *Editor*
E. S. STATELER, *Associate Editor, Chicago*
G. L. MONTGOMERY, *Associate Editor*
F. K. LAWLER, *Managing Editor*
RAY LADUE, *Art Editor*
GRACE HIGHTOWER, *Assistant Editor*
ELIZABETH B. SHAW, *Assistant Editor*
S. T. Henry, Spruce Pine, N. C.
R. S. McBride, Washington, D. C.
Earle Mauldin, Atlanta, Ga.
Paul Wooton, Washington, D. C.
N. A. Bowers, San Francisco, Cal.

VOL. 15, No. 3

MARCH, 1943

DEHYDRATED FOODS
How Potato Shreds Are Made..... 47
Peroxidase Test for Blanching Requires Careful Application *By H. J. Phaff and M. A. Joslyn* 50
Army Specifications for Dehydrated Foods..... 52

SPECIAL FEATURE
Modern Dairy in South America..... 54

MATERIALS
Simple Method of Closing Bags Saves Metal *By Grace Hightower* 56

ENGINEERING
Choose Floors That Withstand Conditions of Processing—Part I .....*By Richard Kanegsberg* 58

MANAGEMENT
Salvage—a Duty As Well As Good Business..... 62
Converts Food Trailer to Bus for Workers..... 64

QUALITY CONTROL
Control of Thermophilic Bacteria in Canned Meat Mixtures *By L. B. Jensen and E. W. Hess* 66
Quality and Profit in a Nickel's Worth of Cup Cakes *By W. R. Van Meter* 68
Bulk Storage and Blending Aid Price, Quality Control—Part II .....*By Edgar S. Miller* 70
Brief Summaries of Grade Standards..... 72

★ ★ ★ CHANGE OF ADDRESS ★ ★ ★

McGRAW-HILL PUBLISHING COMPANY
330 West 42nd Street, New York, N. Y.
Director of Circulation:

Please change my address on "Food Industries"

From .....

.....

To .....

.....

Signed .....

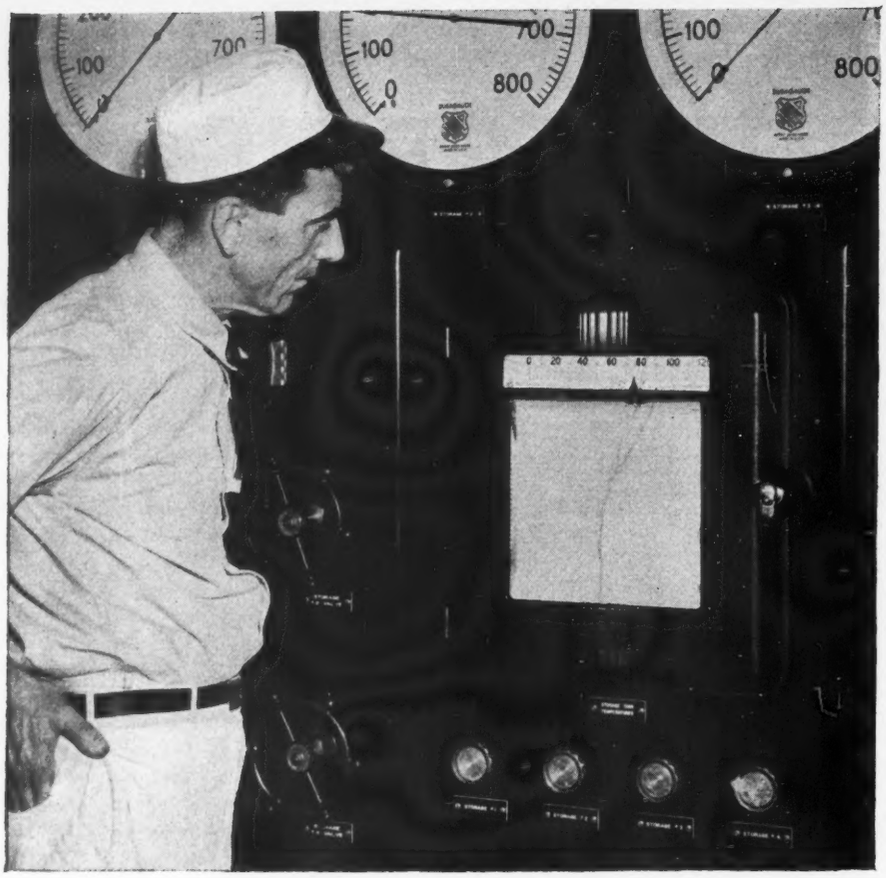
McGRAW-HILL PUBLISHING COMPANY, INC., James H. McGraw, Founder and Honorary Chairman, Publication Office: 99-129 North Broadway, Albany, N. Y. Return postage guaranteed. EDITORIAL AND EXECUTIVE OFFICES: 330 WEST 42ND STREET, NEW YORK.

BRANCH OFFICES: 520 North Michigan Ave., Chicago; 68 Post St., San Francisco; Aldwych House, Aldwych, London, W.C. 2; Washington; Philadelphia; Cleveland; Detroit; Los Angeles; St. Louis; Boston; Atlanta, Ga.

JAMES H. McGRAW, Jr., President; HOWARD EHRLICH, Executive Vice-President; MASON BRITTON, Vice-President; B. R. PUTNAM, Treasurer; JOSEPH A. GERARDI, Secretary, and J. S. BLACKBURN, Jr., Director of Circulation.

CABLE ADDRESS: "McGraw-Hill, N. Y." Member A.B.P. Member of A.B.C. Contents indexed monthly in the Industrial Arts Index.

Copyright, 1943, by McGraw-Hill Publishing Company, Inc.



Typical use of a Micromax Temperature Recorder is for gas temperatures in a Best Foods plant. This instrument is recording four temperatures, inside tanks 250 feet distant.

ON THE "LOW-TEMPERATURE" FRONT
These Micromax Features Help Win

Here are some features which make Micromax Recorders highly accurate in process-industry plants:

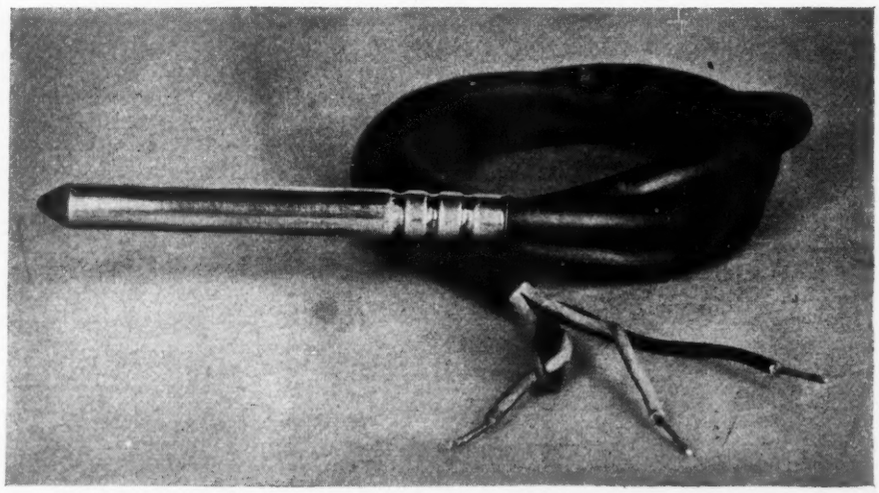
Operates At "Long" Distances. A Micromax may be many hundreds of feet from its Thermohm (electrical-resistance thermometer bulb) and still be as accurate and sensitive as though both were in the same room.

Accidents, corrosion, etc., may, of course damage the thermohm, but it can be replaced on the job, without affecting calibration of Micromax.

Motor-Driven. Taking its operating power from the plant's electric circuit, Micromax does not consume in its mechanism any of the thermal energy it measures. This not only increases accuracy but eliminates calibrated, jewelled bearings, constant-pressure springs and tubes, light, slender pen or pencil arms and delicate parts in general. Micromax sensitivity is that of a finely-fitted machine tool.

As Many as 16 Thermohms may be connected to one Strip-Chart Micromax, and their temperatures recorded in as many as 6 colors. The one-point or two-point Round-Chart Micromax can be read as far as its big dial can be seen.

Micro-responsive Control. The Micromax Recorder's trait of showing extremely tiny changes in temperature is readily extended to automatic control, either in modern on-off applications or by full-floating, proportioning control. In the latter case, the regulated valve may be electrically driven, or may be a pneumatic diaphragm type. We will gladly help select the correct Recorder or Controller for a specific problem, or will send catalogs on request.



A Thermohm (electrical-resistance-thermometer bulb) for use with a Micromax Recorder. By an ingenious use of three leadwires instead of only two, the distance to the Recorder can be anything up to several hundred feet.

LEEDS & NORTHRUP COMPANY, 4912 STENTON AVE., PHILA., PA.

LEEDS & NORTHRUP

MEASURING INSTRUMENTS • TELEMETERS • AUTOMATIC CONTROLS • HEAT-TREATING FURNACES

Jrl Ad N-33C(2)

FOOD INDUSTRIES is published monthly. Price 35c per copy. Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, Food Industries, 330 West 42nd St., New York, N. Y. Subscription rates: United States and possessions, Mexico, Central and South American countries, $3 a year, $4 for two years, $5 for three years. Canada, $3.50 a year; $5 for two years; $6 for three years (payable in Canadian or U. S. Funds). Great Britain and British possessions, 20 shillings for one year, 60 shillings for three years. All other countries, $5 a year, $8 for two years, $10 for three years. Entered as second-class matter, Aug. 17, 1936, at Post Office, Albany, N. Y., under act of March 3, 1879.

ST. REGIS MULTIWALL PAPER BAGS

St. Regis Paper Bags not only *look* clean. They *are* clean... and sift-proof. Clean to handle, to stack, and to use.

These sturdy bags *look* easy to handle . . . and they are. Firm, compact... no dust or dirt clinging to their smooth, tough surface.

Under the outside ply of rugged kraft paper are the several other plies that give the Multiwall Bag its name. There may be plies to resist chemical action, to withstand moisture penetration, etc., depending on your particular requirements.

Performance is winning new users every day. *Your* customers, too, will like Multiwalls because they give 100% protection.

When you deal with St. Regis you get bags that are *custom*-built to your needs. *Plus*... specialized *service* which gives you the benefit of our long years of experience manufacturing and installing filling machines and closing equipment *as well as making bags.* Foods are among the more than 300 products successfully packed in Multiwall Paper Bags. If you ship in units of 25 to 100 lbs. it may pay you to discuss changing over *now* with a St. Regis sales engineer.

St. Regis Multiwall Bags are made with multiple independent walls. They are astoundingly strong, moisture-resistant, and impervious to dust, dirt, or insects.

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

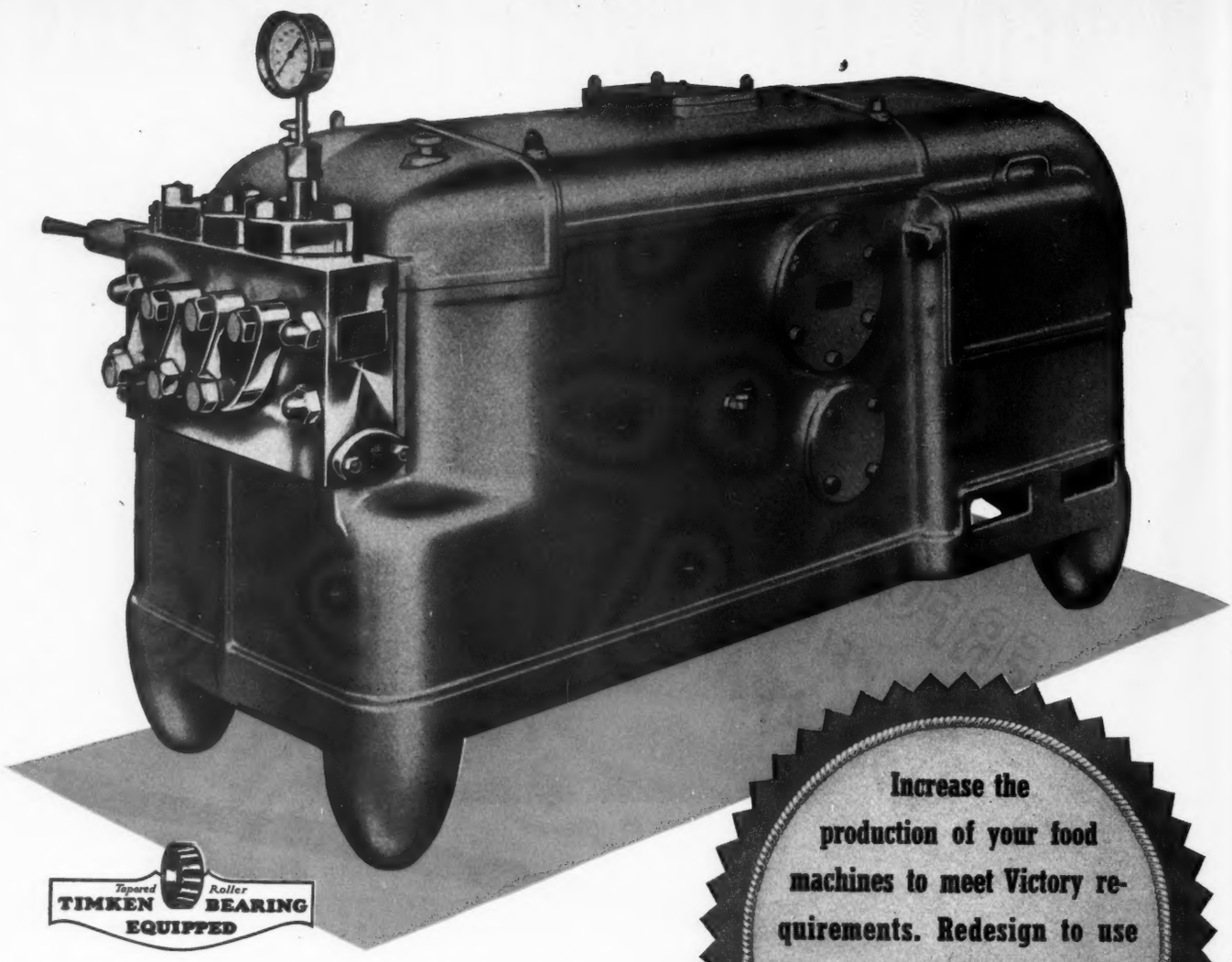
ST. REGIS PAPER COMPANY

TAGGART CORPORATION • THE VALVE BAG COMPANY

NEW YORK: 230 Park Avenue

CHICAGO: 230 No. Michigan Avenue

Offices also at: Baltimore, Md. · Birmingham, Ala. · Dallas, Tex. · Denver, Colo. · Franklin, Va. · Los Angeles, Calif. · Nazareth, Pa. · New Orleans, La. · San Francisco, Calif. · Seattle, Wash. · Toledo, Ohio



The Viscolizer as shown above, manufactured by the Union Steam Pump Company, is equipped with Timken Bearings. The Viscolizer is used in homogenizing milk, ice cream and other food products. It is sold by Cherry-Burrell Corporation.

Increase the production of your food machines to meet Victory requirements. Redesign to use more Timken Bearings. Then you'll also have an edge on post-war competition.

All kinds of equipment used in the food industries —whether directly or indirectly connected with food preparation — operates more efficiently and economically when equipped with Timken Tapered Roller Bearings; the more it contains the better it performs—because the greater its protection against friction; wear; radial, thrust and combined loads; and misalignment.

Equipment designers who use Timken Bearings at every suitable position in the machines they create give their companies a twofold advantage—*better* machines and *better selling* machines—for the trade-mark "TIMKEN" signifies superiority to equipment buyers everywhere. The Timken Roller Bearing Company, Canton, Ohio.

"All There Is In Bearings"

The one test for every decision—
will it help to win the war?

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

MILK CASES are conveyed to and from washing and filling operations and hurried to waiting delivery trucks, on No. 4250 Swivel Chain Conveyors.

KEEP PRODUCTION "ON THE MOVE" WITH LINK-BELT SWIVEL CHAIN

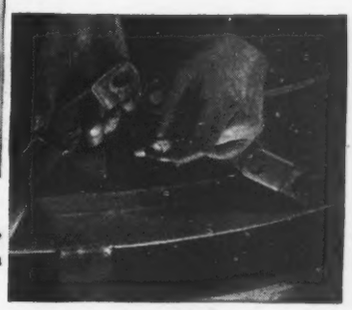
CASES OF BEER are conveyed from automatic packing machine to storehouse or direct to shipping department. Conveyor employs two strands of No. 4250 Swivel Chain.

● Link-Belt No. 4250 Swivel Chain is a durable, quickly detachable, extremely flexible chain for conveying cases, cartons, crates and cans.

The links provide a broad, flat, clean carrying surface. The cast ball and socket type pin makes the chain easily detachable, and the joint construction permits great flexibility and short radii for lateral curves. Chain usually operates in standard 2″ channel track and will operate around horizontal curves as small as 12″ radius. Made of Promal or Molybdenum Promal to assure long-life and trouble-free operation.

Link-Belt Chain Engineers have helped solve conveyor and drive problems in many industries.

Operates in standard 2″ channel tracks. Can be used on existing installations.



Requires no tools for assembling or disconnecting. The chain may be lifted out of the track and taken apart quickly by hand.

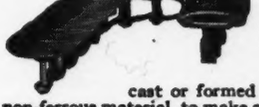
LINK-BELT COMPANY

The Leading Manufacturer of Equipment for Handling Materials and Transmitting Power

Indianapolis Chicago Philadelphia Atlanta Dallas
San Francisco Toronto

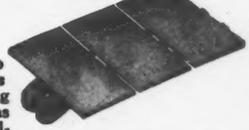
Offices, warehouses and distributors in principal cities 8505A

OTHER TYPES OF LINK-BELT CARRIER CHAINS



Link-Belt Crescent Conveyor Chain with attachments, is cast or formed from ferrous or non-ferrous material, to make a continuous conveyor for handling bottles or other containers in a rectangular, circular, semi-circular or snake-like path.

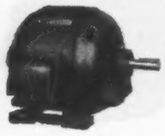
Link-Belt Universal Carrier Chain is an accurately made, finished steel chain equipped with smooth, uniform, steel top plates. It carries containers—bottles, jars, cans in the process of manufacture, and in cleaning, filling and capping operations around corners, without sliding.



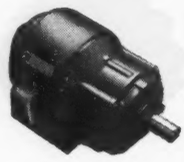
Silverlink Flat-Top Conveyor Chain is used for handling bottles, jars and cans through cleaning, filling, and capping operations. For this service, the chain articulates freely and prevents "humping."

LINK-BELT CHAINS

For "WET END" POWER to drive washers, peelers, cutters, pumps, conveyors ● The G-E Splashproof TRI-CLAD motor is unusually well protected against damage from moisture, steam, or wash water. Daily hosing down can't injure windings or bearings. Its smooth, corrosion-resisting, cast-iron exterior is easy to keep clean. It can be mounted where most convenient without the use of protecting canopies.

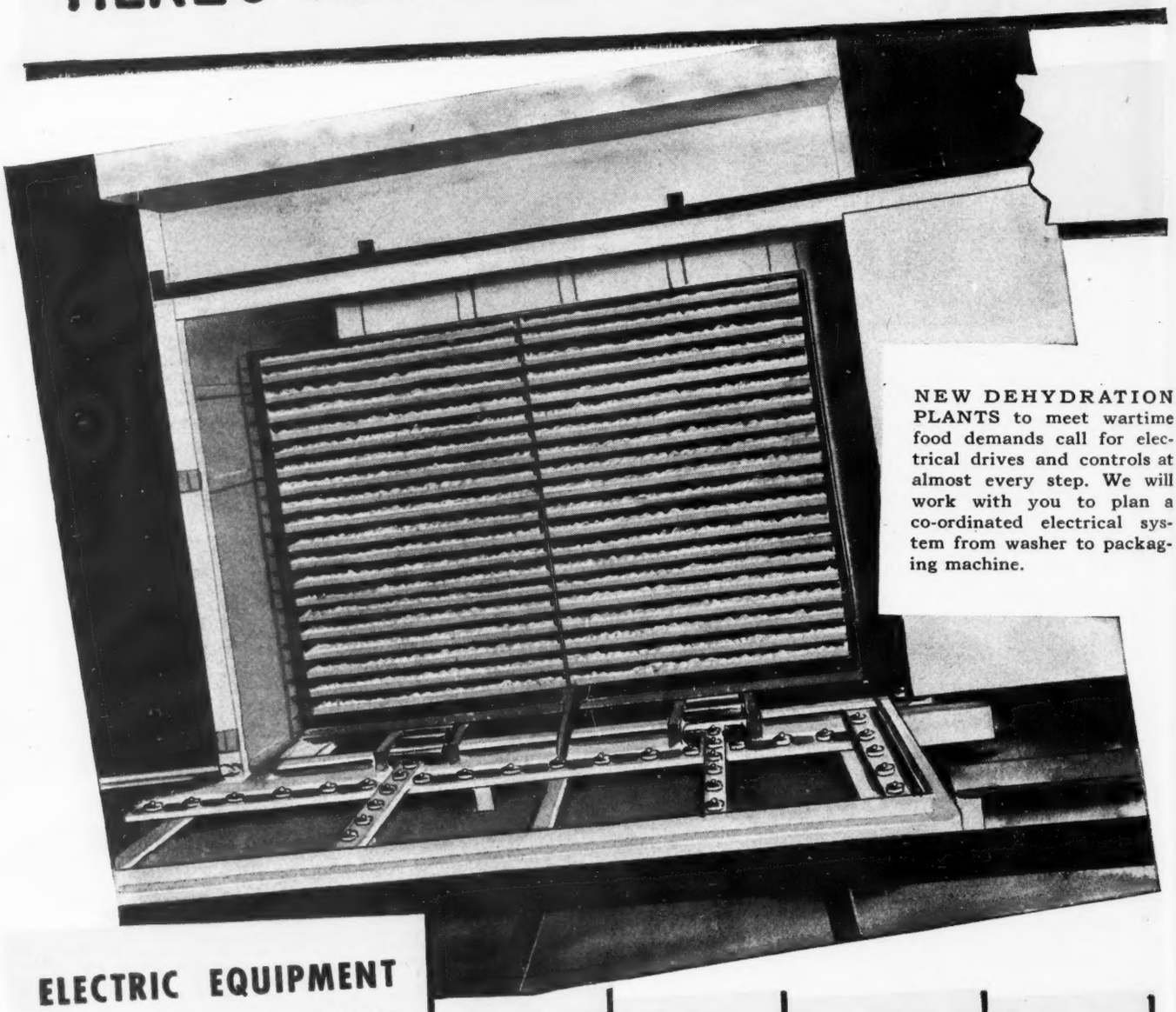


For LOW-SPEED DRIVES on conveyor lines ● A Tri-Clad gear-motor combines motor and speed reducer in a single compact unit. It simplifies mounting and maintenance problems, promotes safety and cleanliness. Made in a full range of sizes, and for speed requirements from 780 down to 13.5 rpm.



DEPENDABLE MOTOR POWER for fans, pumps and packaging machinery ● Standard Tri-Clad induction motors have no openings in the upper portion. Inside and out, they resist moisture, high ambient temperatures, and other unfavorable conditions. They are highly recommended for continuous operations where failure of one small motor might shut down an entire "line." Builders of pumps, fans etc., can supply them.

HERE'S YOUR ELECTRICAL LINE-UP

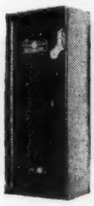


NEW DEHYDRATION PLANTS to meet wartime food demands call for electrical drives and controls at almost every step. We will work with you to plan a co-ordinated electrical system from washer to packaging machine.

ELECTRIC EQUIPMENT FOR EVERY OPERATION

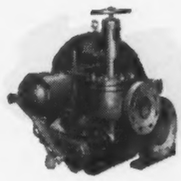
Washing | **Peeling** | **Trimming** | **Slicing**

SIMPLE, CONVENIENT motor control ● Motor controls are a key factor in the continuity of process operations. By selecting from the complete line of G-E control and accessories it is possible to have the type that best meets the requirements of the job. G.E. can help you choose equipment for clean, dusty, or wet locations, or which best combines safety, reliability, and ease of installation.



For TIMING DRYING OPERATIONS and other process cycles ● General Electric time switches and other automatic controls include units exactly suited to food plant needs. The TSA-14 time switch opens and closes contacts for repeating-cycle processes, covering a total time cycle from 10 seconds to 60 minutes or longer. The TSA-10 opens or closes contacts a specified length of time after the process is begun.

For DRIVING FANS on steam-heated dryers ● These small mechanical-drive turbines (Type D) produce economical power while acting as a reducing valve to supply low-pressure steam for heating coils or other processing needs. They are particularly advantageous on dryers where fan operation and steam supply for the coils are required simultaneously. G.E. builds them in capacities from 5 hp up. Bulletin GEA-1145D gives full information.



FOR LARGE SCALE DEHYDRATION...

ARE wartime food demands bringing you face to face with new problems in mechanized food processing: how to raise output with limited man power . . . how to maintain quality with inexperienced help . . . how to switch from batch operations to continuous, large-scale production?

Then whether it's dehydration, canning, freezing, or some other branch of food technology, General Electric can help you get lined up *electrically!*

A Special Service for Food Plants

Anything that can be done electrically to speed up or improve your output can probably be done *better* with the help of G-E Application Engineers. They'll help you choose the *right* equipment—for fast installation, faithful performance, and to meet unusual or intricate processing cycles. And it will be supplied *on time*, to the full extent that your priority status permits.

Here's What to Do

If you're now laying out new food processing lines, call G.E. *before* you order your equipment. Then the electrical drives and controls can be so arranged as to "tie-in" well as a part of an integrated system. This will simplify operations and cut maintenance costs.

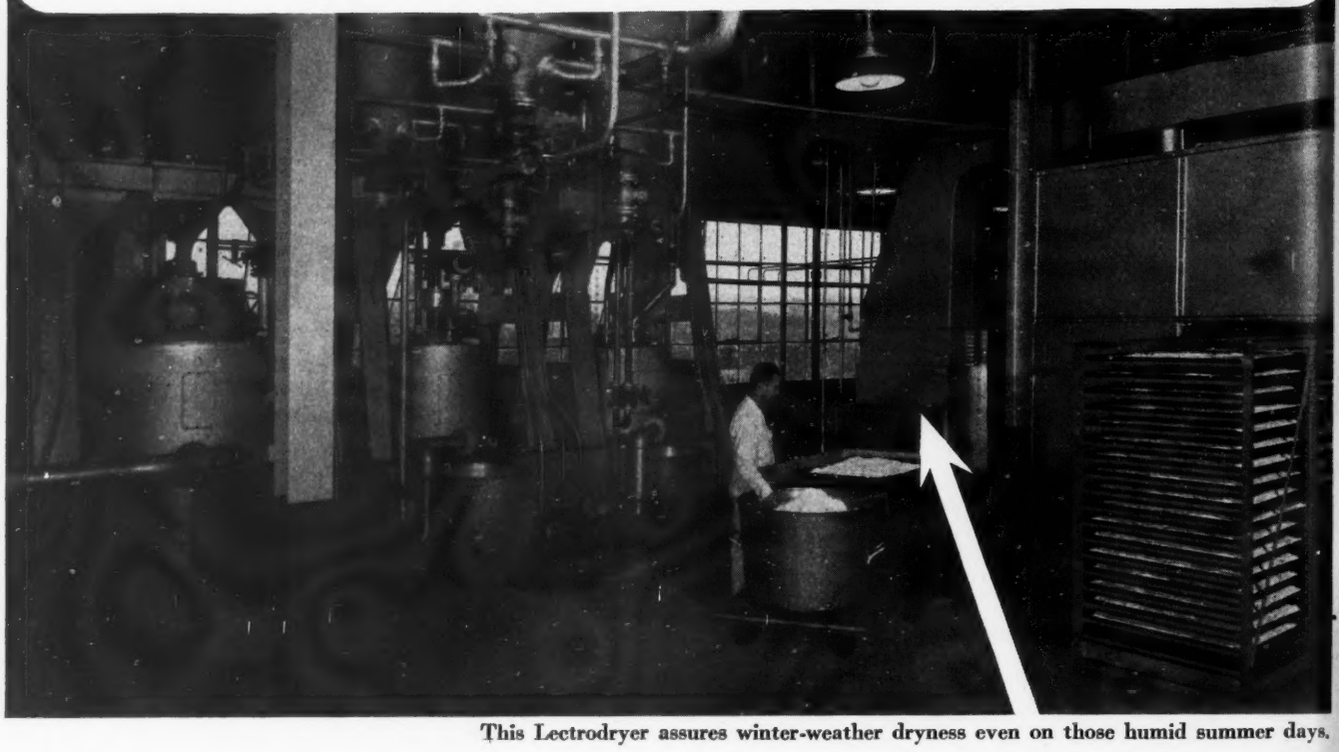
A call to your local G-E office will establish contact with our engineers familiar with food plant electrical requirements. *General Electric Company, Schenectady, N. Y.*

GENERAL ELECTRIC

750-212-110

Weighing | Blanching | Traying | Drying | Inspection | Packing

Why be a "winter-weather" operator?



This Lectrodryer assures winter-weather dryness even on those humid summer days.

The Drug Industry proved years ago that you can avoid that summertime jinx, uncertain drying weather. By controlling relative humidities with Lectrodryers, they work in "winter weather" the year 'round, regardless of outside weather conditions. Processes are standardized and product quality is held uniform.

The Food Industry is up against exactly the same problems. Lectrodryers can help you standardize work in your present driers. They will give you a greater degree of dryness than can be obtained in the most favorable weather conditions. Lectrodryers will condition air for processing and packaging operations.

The drying agent in Lectrodryers is Activated Alumina. Beds of this material are automatically cut in and out of service as they become laden with moisture, are reactivated and put back into service. A continuous flow of evenly dehumidified air is insured.

Lectrodryers have wide experience in this business of drying and conditioning air. They've been doing this kind of work for years, in many industries. Recommendations that our engineers make to you are based, therefore, on experience, not guesswork. PITTSBURGH LECTRODRYER CORPORATION, 301 32nd Street, Pittsburgh, Pennsylvania.

LECTRODRYERS DRY WITH ACTIVATED ALUMINAS

PITTSBURGH

LECTRODRYER

CORPORATION

Reg. U.S. Pat. Off.

A WORLD OF POWER!

As one of the few great names in Electric Power, it has been the province of Crocker-Wheeler to pioneer in the application of Electric Motors and Generators for many individual industries.

Today . . . as a part of the greater Joshua Hendy Iron Works . . . our enlarged productive facilities and specialized knowledge are more than ever available to all war industry.

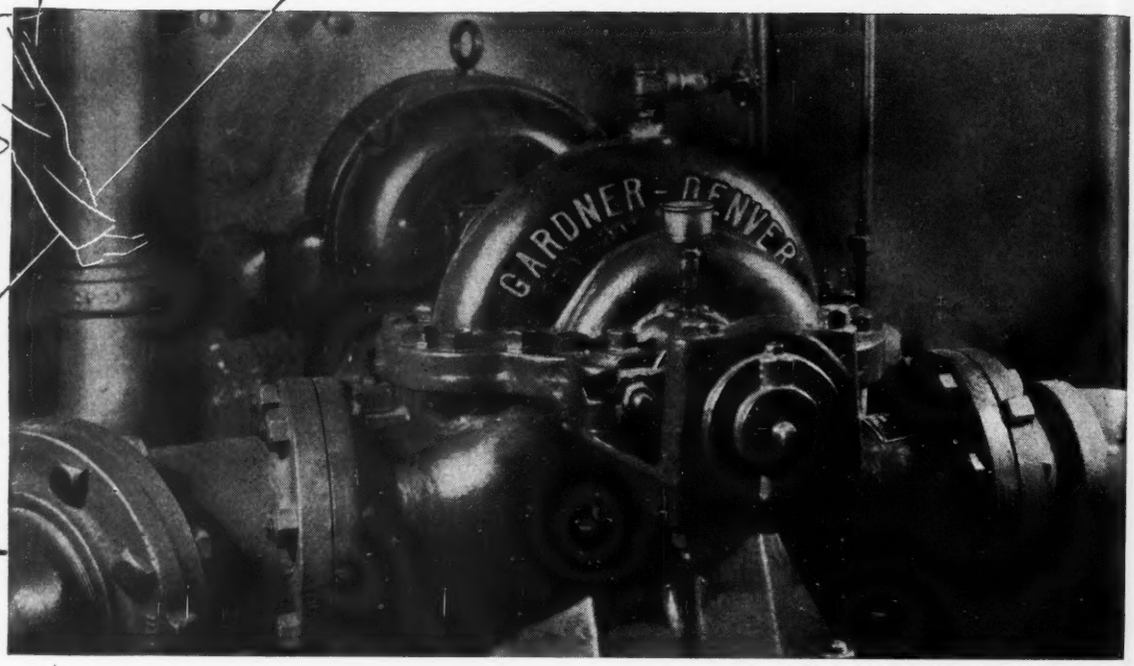
Crocker-Wheeler Electric Manufacturing Company. Ampere N. J., Division of Joshua Hendy Iron Works.

TRADE MARK REG. U.S. PAT. OFF.

CROCKER-WHEELER

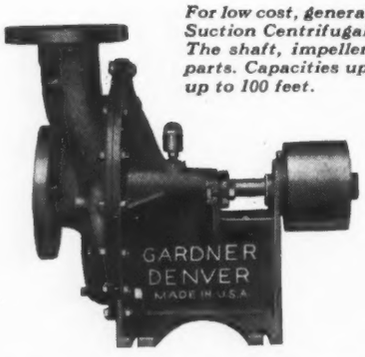
SINCE 1888

Over the Line that Makes the Difference

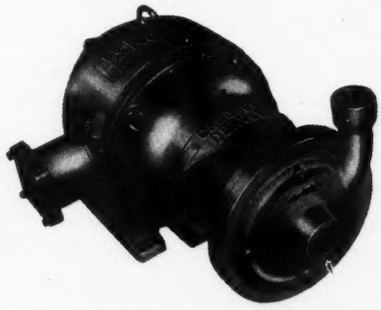


A FEW *extra* per cent can make all the differences when you're figuring centrifugal pump efficiency. Gardner-Denver centrifugal pumps were *designed* to have that extra efficiency between profit and loss in centrifugal pump operation. Gardner-Denver centrifugals often pay for themselves with increased output and lower power costs within a short time after installation.

To give you this extra efficiency—Gardner-Denver centrifugal pumps were designed with properly proportioned water passages—with impellers and casings embodying every modern hydraulic advantage. Gardner-Denver centrifugals are proving their ability to lower the cost per thousand gallons pumped in scores of plants throughout the country.



For low cost, general utility service, Gardner-Denver Side Suction Centrifugals are compact and simple in design. The shaft, impeller and bearings are the only moving parts. Capacities up to 1600 gallons per minute at heads up to 100 feet.



Ready for installing in any desired position, Gardner-Denver Close-Coupled Centrifugal Pumps are complete, compact units. Pump and splash-proof motor are mounted on the same rugged shaft. Capacities range from 30 to 1200 gallons per minute at heads up to 300 feet. These pumps are also available as self-priming units.

For bulletins describing Gardner-Denver Centrifugal Pumps, write
Gardner-Denver Company, Quincy, Illinois

GARDNER-DENVER *Since 1859*

NOTES ON CONSERVATION OF CRITICAL MATERIALS

Plant operating men fully realize that their present supply of Monel wire cloth must last a long time. The day will come when they must patch and repair—when sections from discarded wire cloth filter elements must be joined to make one serviceable unit for a filter, strainer or washer.

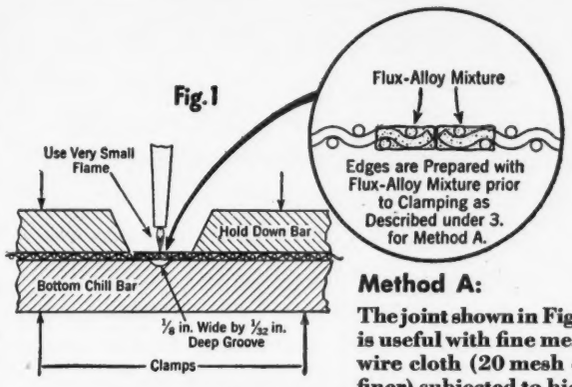
To the many operators whose Monel wire cloth is still in good condition, we recommend that they save the following suggestions for future use. For full information on joining Monel, write for Bulletin T-2, "Welding, Brazing, and Soft Soldering of Monel, Nickel, and Inconel."

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street **New York, N.Y.**

METHODS OF JOINING MONEL WIRE CLOTH

The soldering or brazing methods used for making wire cloth seams or repairs determine, in many cases, the service life of the cover. The common method of making a joint by lapping and filling with soft solder may result in low joint strength and closing of an unnecessary number of openings. Suggestions on preferred silver brazing methods are given below:

Fig. 1


Flux-Alloy Mixture
Edges are Prepared with Flux-Alloy Mixture prior to Clamping as Described under 3. for Method A.
Use Very Small Flame
Hold Down Bar
Bottom Chill Bar
1/8 in. Wide by 1/32 in. Deep Groove
Clamps

Method A:

The joint shown in Fig. 1 is useful with fine mesh wire cloth (20 mesh or finer) subjected to high stresses or vibration during service. The joint is made in a fixture as shown in Fig. 1. Heavier hold-down bars are used when clamping is not practical. The bars are beveled to facilitate entry of the flame to the joint.

Sequence of Operations

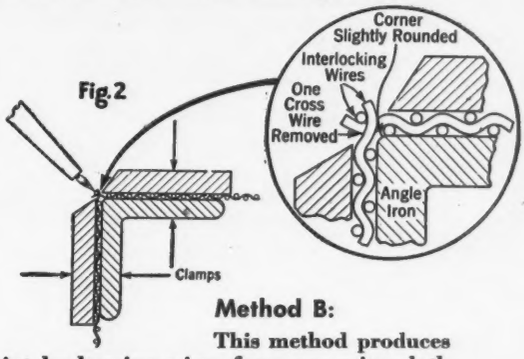
1. The wire cloth edges are cleaned thoroughly to remove oil, grease and corrosion products.

2. The edges of the wire cloth sections to be joined are trimmed carefully to expose a wire running parallel to the joint.

3. Each trimmed edge is set up separately in a jig so that 2 or 3 mesh openings are exposed. This edge is then painted with a mixture consisting of silver brazing flux and a heavy loading of 200 mesh silver brazing alloy filings* (such as "Handy Flux" and "Easy-Flo" filings). The flux-alloy mixture is then fused with a very small flame and the resulting edge filed straight to remove irregularities.

4. The prepared edges of the wire cloth sections are then butted tightly in the fixture shown in Fig. 1 and once more painted lightly with the flux-alloy mixture and then fused together with a flame. Care in the use of the torch will insure a minimum number of closed mesh openings.

Fig. 2



Method B:

This method produces a joint by brazing wires from one wire cloth section *interlocked* behind the first parallel wire of the other wire cloth section.

Sequence of Operations

1. The wire cloth edges are cleaned thoroughly to remove oil, grease and corrosion products.

2. The edges of both wire cloth sections to be joined are trimmed carefully and one cross wire parallel to the edge of one wire cloth is removed to permit interlocking and clamping as shown in Fig. 2.

3. Flux and silver brazing alloy is applied and the brazing completed in one pass.

4. Removed from the fixture, the joint is flattened and the remaining small ridge eliminated by hammering lightly with a wooden mallet, using a smooth hard wood block as a dolly.

*Filings are procurable through the producers of silver brazing products.

★ ★ ★ ★ ★ **INCO NICKEL ALLOYS** ★ ★ ★ ★ ★

MONEL • "K" MONEL • "S" MONEL • "R" MONEL • "KR" MONEL • INCONEL • "Z" NICKEL • NICKEL

Sheet . . . Strip . . . Rod . . . Tubing . . . Wire . . . Castings

CENTURY FORM J MOTOR

Protection Against Falling Solids and Dripping Liquids

The top half of the motor is closed. Cooling air enters at both ends and is discharged below the shaft line.

The upper half of the Century Form J general purpose, open, continuous duty motor is closed to minimize the possibility of dripping liquids or falling solids entering the vital parts of the motor.

This added protection feature is made possible because of the scientifically designed Century mechanical ventilation system. All motors generate heat, so if the insulation is to have long life, the heat must be rapidly carried away from the windings. Two powerful fans located behind each bearing bracket draw cooling air "IN" through the bearing bracket openings. This cooling air is deflected first around the bearings to keep them cool and then across the windings and to air passages between the outer surfaces of the magnetic core and the frame—the heated air being finally discharged "OUT" through the openings located at the sides and bottom of the frame.

These modern, protected, industrial, general purpose motors meet the requirements of more than 80% of all polyphase motor applications. This Form J construction is at present available in 2 to 15 horsepower four-pole frame sizes.

Your Century Motor Specialist has full information and his wide experience may well prove valuable to you. We suggest you call him in today.

Century MOTORS

Help You Beat the Production Promise

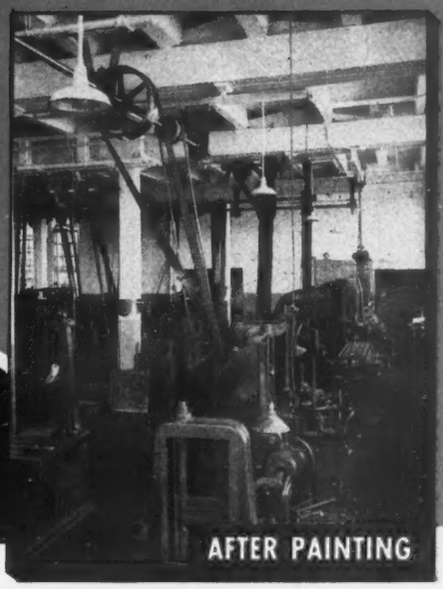
CENTURY ELECTRIC CO., 1806 Pine St., St. Louis, Mo.

Offices and Stock Points in Principal Cities

318

One of the Largest EXCLUSIVE Motor and Generator Manufacturers in the World.

DO YOU KNOW THAT WHITE CEILINGS AND WALLS CAN INCREASE PLANT OUTPUT AS MUCH AS 10% ?



THE FACT that a fresh coat of *white* paint on plant ceilings and walls can step up production as much as 10% is well known to many operating and maintenance men. It's a fact you can check up *right now* by calling any lighting expert of your acquaintance. He'll agree that unless your plant is properly painted, you're losing up to 60% of the light you're paying for *and up to 10% of the production your present equipment could be turning out.*

PAINT, he'll tell you, *is part of your lighting system**. You may have the finest lighting equipment money can buy, but unless it's backed up by clean *white* ceilings and walls, you're not getting all the light you need for maximum output. Faulty workmanship, heavy spoilage, avoidable accidents resulting from fatigue and poor seeing —all take a toll of vital man-hours that *white* paint could help save.

"That's fine," you may say, "but we haven't the *time* to paint!" That's where your trained BARRELED SUNLIGHT Representative comes in!

Backed by our more than 40 years of specialization in *white* paint for industry, he's equipped to recommend the materials and procedure that will get you the extra light you need with the least possible interruption of production schedules. He can even recommend industrial painting experts who often can paint an entire plant without the loss of a single production hour.

There's a type and finish of BARRELED SUNLIGHT for every need and condition — each the most practical of its kind for large industrial areas. Send for your copy of "The Right Paint for Your Plant," which gives further details on what *white* paint can do for your plant. Better still, let a trained BARRELED SUNLIGHT Representative *inspect* your plant and help you plan a painting program geared to your production needs. Write or wire to U. S. Gutta Percha Paint Company, 37C Dudley Street, Providence, R. I.

**Better Vision Institute*

BARRELED SUNLIGHT

SPECIALISTS FOR OVER 40 YEARS IN WHITE PAINT FOR INDUSTRY

HOW would you like a Mastodon Steak 10,000 years old? Scientists have reported that meat, frozen into and transported by glaciers for centuries, has been found well preserved and still edible.

Adequate, continuous, dependable refrigeration made this possible, just as modern mechanical refrigeration makes possible the preservation of America's bountiful foods in this critical war era.

Calcium chloride is the favored refrigeration brine because it minimizes corrosion, protects irreplaceable equipment and delivers more refrigeration, faster, than any other brine medium.

A brand-new Refrigeration Data Book gives tables, charts and general data — contains brine record forms and valuable refrigeration information. Just ask for Bulletin No. 30. Calcium Chloride Association, 4145 Penobscot Building, Detroit, Michigan.

Bright Spots *in a* Food Plant Operator's *Life*

How to end Steam Trap troubles? ASK YARWAY TRAP USERS.

They will tell you, as they have told us, what they think of Yarway *Impulse* Steam Traps. They will tell you:

About their quicker heating—minutes, hours, days, saved in starting up.

About their sustained efficiency—in keeping machines, equipment and heating systems hotter, all the time.

About their low maintenance—where other type traps have given continual trouble—have required frequent renewal of parts.

About their fuel savings—through proper draining and elimination of air-binding—through less radiation loss due to this trap's small size.

About their ease of installation—requiring no supports, less space. (Same trap without change in valve or seat is applicable to almost all requirements.)

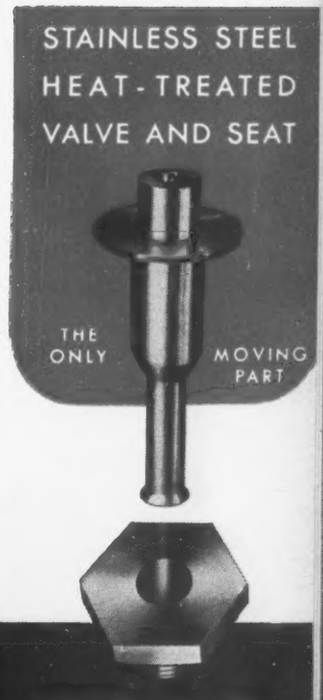
About their low price—often costing less to install than to repair other types of traps.

Ask Yarway Trap users, or better yet—*get* some Yarway Traps, try them out in your own plant, write your own testimonial.

A near-by mill supply house handles them. There are more than 100 Yarway distributors in principal cities.

Catalog T-1737 sent on request.

YARNALL-WARING COMPANY
127 Mermaid Ave., Philadelphia



YARWAY IMPULSE STEAM TRAP

ALOYCO IS THE NAME FOR PERMANENTLY CLEAN FLUID CONTROL!

ALOYCO Stainless Steel Valves and Fittings are better than an insurance policy against shutdowns in fluid lines. They help to keep production at peak in the vital chemical, process and food industries by preventing corrosion, stain and contamination.

The recognized superiority of Aloyco Stainless Steel Valves and Fittings is due to concentration on this one type of product. Stainless Steel Valves and Fittings are not *part* of the Aloyco line — they are the *entire* line. They do not receive *part* of the attention of our engineering and production department — they receive *all* of it. We make a wide range of styles and sizes in all standard stainless steel analyses.

Although our facilities are allocated 100% to essential war production these days, we are always glad to discuss post war applications with those who are mapping the industrial pattern of the future.

"...and pass the Ammunition"

Fighting food, health and energy "ammunition," is being distributed to our lads in all corners of the world. The gigantic task of providing for our warriors and war workers abroad and at home, plus those millions dependent upon lend-lease supplies, staggers the imagination. Still the prodigious job must be done. To this purpose, the folks at Rhinelander paper mills are contributing the limit of their abilities. In spite of our greatly expanded facilities, they still seem inadequate to supply the vastly increased paper demand created by new applications. Rhinelander protective papers are not only safeguarding foodstuffs at home and abroad, but are serving a variety of other essential purposes in protecting parts for planes, guns, tanks and other war materiel. Again we pledge ourselves to keep the paper coming — first for our Country's war needs — then to you and your needs.

Otto Becker

PRESIDENT
RHINELANDER PAPER COMPANY

RHINELANDER
PROTECTIVE PACKAGING
Papers

FROM THE BEST THAT'S MADE TO THE CHEAPEST THAT'S GOOD

Genuine Greaseproof
Coffee Bag Papers
Confectionery Papers
Cereal Wrapping Papers

Laminated Greaseproof Papers
Lard and Shortening Liners
Bakery Product Wraps
Coated Food Packaging Papers

Cracker Box Liners
Greaseproof Innerwraps
Glassine Papers, Plain, Colored & Embossed

Wax Laminated Glassine
Opaque Label & Bag Glassine
Packing Industry Wrappings — and Specialties to order

RHINELANDER PAPER COMPANY • MILLS AT RHINELANDER, WISCONSIN, U.S.A.

Nothing great was ever achieved without enthusiasm

✓ Another good thought passed on by

KVP

MAKERS OF

FOOD PROTECTION PAPERS

KALAMAZOO VEGETABLE PARCHMENT COMPANY

PARCHMENT, KALAMAZOO, MICHIGAN

BRANCH PLANTS IN PHILADELPHIA, PA., AND HOUSTON, TEXAS

POMONA PUMPS STRETCH YOUR PUMPING DOLLAR

TAKE ADVANTAGE OF CONSTRUCTION

ARE YOU TAKING *FULL* ADVANTAGE OF POMONA'S MANY CONSTRUCTION FEATURES?

Pomona owners are doubly fortunate in these times because no other type pump can match Pomonas for high efficiency... for adaptability to varying job requirements... for low maintenance and operating costs... and for all-around ability to handle virtually *any* pumping application encountered.

Among the *many* construction features that make Pomonas so uniformly efficient under a wide variety of operating conditions, the following are typical...

VERTICAL DESIGN

The motor head is at the surface where it can be easily serviced and lubricated

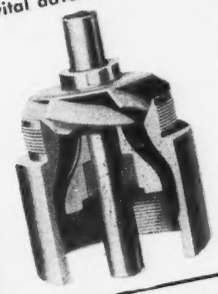
Because Pomonas are *vertical* pumps they require a minimum of floor space... in fact, can be mounted directly *over* tanks, vats, or sumps. No costly foundations are needed, no need to disturb existing plant installations. In addition, they require no priming to start, so may be located in out-of-the-way places unsuited to other equipment or can be operated by remote control. ***No other pump is so easy to move from one job to another. No other pump operates with so little attention!***

The pump is at fluid level where it requires no priming, no wetted floor space

Let your nearby Pomona dealer check over your installation and suggest ways you can make greater use of the many advanced construction features incorporated in your Pomona pump!

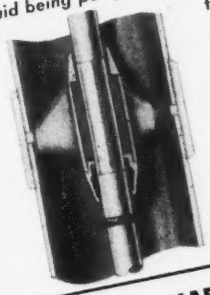
SEMI-OPEN IMPELLERS

Pomona's Semi-Open Impellers and Bulbous Vaned Pump Bowls represent a vital advancement in both design and performance. Pomona impeller clearance can be adjusted quickly and easily at the pump head, permitting pump capacity to be varied up to 60% of design point without costly throttling. Semi-open impellers will also handle gritty, pulpy or fluctuating flows more efficiently, and greatly minimize risk of vapor, gas or air locking. **Thus, Pomonas can be quickly adapted to a wide range of pumping requirements and fluids with uniformly high operating efficiency!**



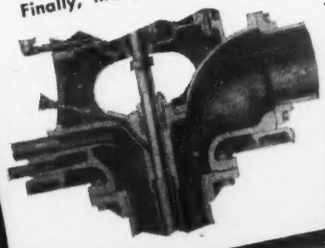
WATER LUBRICATION

In Pomonas, ALL bearings below the motor head are self-lubricated by the fluid being pumped. There are no oil tubes or grease chambers to leak, therefore no risk of contaminating either product or equipment. Also, because lubrication is foolproof, positive, Pomonas take care of themselves without need for frequent attention. **You can use your Pomona for practically any pumping job in your plant with perfect safety to the pump and to the product!**



OPEN DRIVE SHAFT

Pomona impellers are driven by an open drive shaft which eliminates the buying, installing and servicing of a separate housing when conversions are made. Because there are no oil tubes or grease chambers, Pomonas handle fluids under a wide range of temperatures, further increasing their versatility. Finally, the pump can be lengthened or shortened by simply adding or removing standard length shaft sections ...can be converted from deepwell primary water supply to close-coupled industrial pumping—or vice versa—at minimum cost. **Pomona's need never be idle!**



POMONA
Water-Lubricated
PUMPS

POMONA PUMP CO., The Standard, New York City
Plants located at 4001 South Soto Street, Los Angeles, and 206 Commercial Street, Pomona, California

DIVISION OF JOSHUA HENDY IRON WORKS

A New Name
in the steel container field

But no change in the service to our customers. For several years Wilson & Bennett Manufacturing Company has been operated as a subsidiary of the Inland Steel Company under the management of H. Denbigh Ellis, president. Now the new name, Inland Steel-Container Company, further identifies this company with its parent organization. It symbolizes continued progress in the development of still better containers for our customers' products.

Made in 3 gallon to 55 gallon capacities

INLAND STEEL CONTAINER CO.

Formerly WILSON & BENNETT MANUFACTURING COMPANY

6532 S. MENARD AVE. CHICAGO, ILLINOIS

Plants at Chicago—Jersey City—New Orleans—Richmond, Calif.

Sales offices in all principal cities

CONTAINER SPECIALISTS

INLAND STEEL CONTAINER CO. Steri Seald LINED STEEL CONTAINERS JERSEY CITY · NEW ORLEANS RICHMOND, CALIF. CHICAGO

Now...

GREER CONVEYORS

Hoist the Ammunition!

DELIVERING "enough and on time" has long been duck soup for Greer conveyors. Fact is, the Greer Multi-tier Conveyor holds a leading place in the confectionery and bakery fields because of the unique ingenuity of its construction, precision operation, and staunch reliability.

So... hoisting ammunition in U. S. Navy destroyers gives Greer conveyors a front-line chance to make it mighty hot for Axis submarines. Such installations are putting to good use Greer's ability to build conveying machinery. Today, Greer "is in the Navy" one hundred per cent — making vitally essential war products for Uncle Sam to put to work on the fighting fronts of the seven seas.

But we want all our good friends throughout the country who are using Greer Confectionery and Bakery Machinery to know that we stand ready to help them to the utmost of our ability. Any problem of maintenance or part replacement that they now have is the problem of Greer engineers, too. We want to hear about it.—J. W. Greer Company, 119 Windsor Street, Cambridge, Massachusetts.

MAKERS OF FAMOUS **GREER** **MULTI-TIER CONVEYOR**

He's carrying an Army "Field Kitchen" right in his pocket

IN STURDY, LIGHT-WEIGHT PAPERBOARD CARTONS

A paratrooper's appetite on a tough assignment is likely to get pretty far ahead of the company field kitchen. He's got to take along with him most of the things he's going to need to sustain himself.

That's where Gardner-Richardson paperboard cartons are doing a mighty important fighting job, today. Inside these compact, space-saving, weight-saving cartons (the size of a candy bar), our soldiers find full course meals. In other cartons in their pack, extra ammunition, medical supplies.

These tough, ingenious folding cartons not only multiply the capacity of packs, but also the cargo space in ships, planes and trucks, rushing food and supplies to our armed forces around the globe.

Paperboard is also stepping in to do the job where other vital materials have gone to war. In one instance, alone, a Gardner-Richardson development has already saved 1,444,000 pounds of metal.

Today, Gardner-Richardson engineers, technicians and workers are bending their shoulders to these wartime jobs . . . their No. 1 jobs until victory.

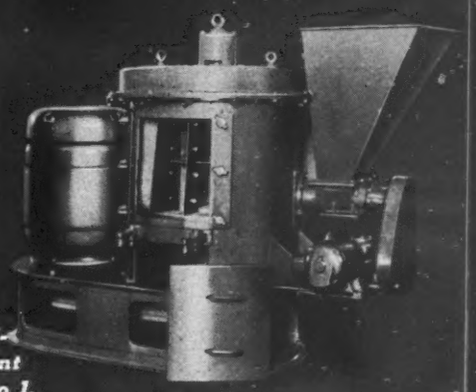
. . . a full course meal in a carton no longer than a candy bar

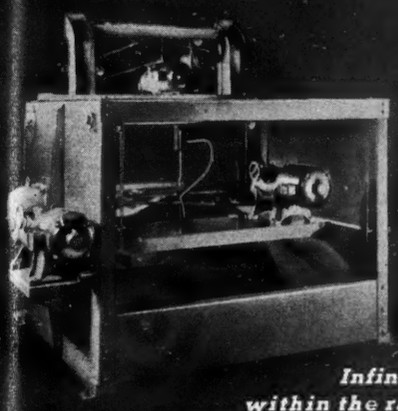
The GARDNER-RICHARDSON Co.

Manufacturers of Folding Cartons and Boxboard

MIDDLETOWN, OHIO

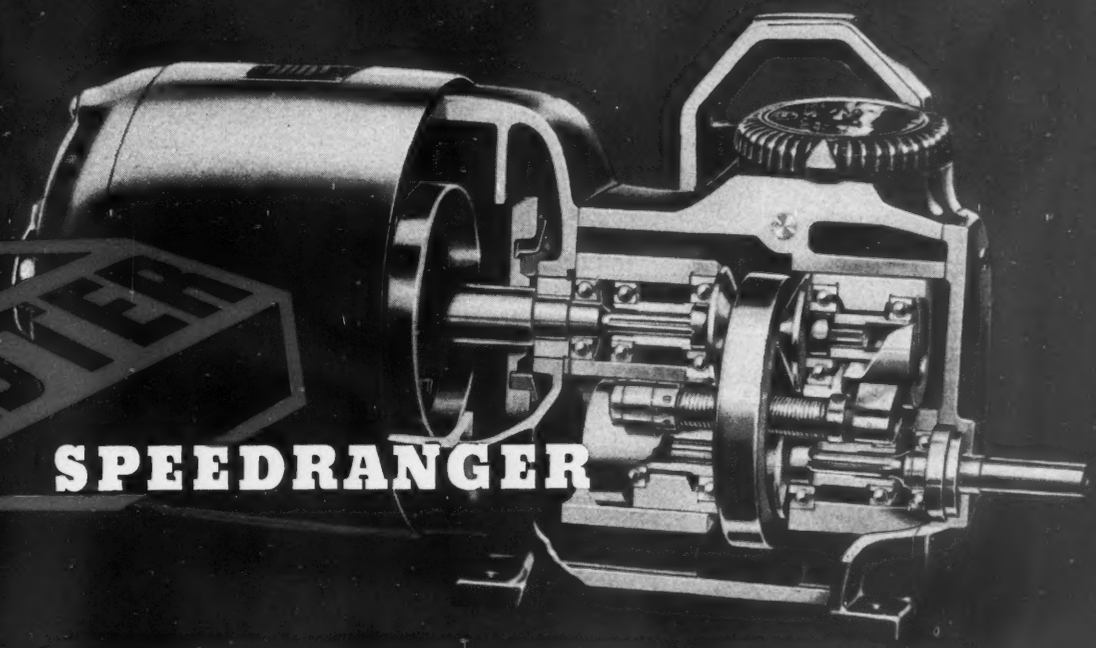
Sales Representatives in Principal Cities: PHILADELPHIA • CLEVELAND
CHICAGO • ST. LOUIS • NEW YORK • BOSTON • PITTSBURGH • DETROIT





Available in sizes up to and including 3 horsepower in three different speed ranges—3 to 1, 6 to 1 and 9 to 1. Only with an all-metal drive can you secure the compactness, simplicity, flexibility and economy that are so advantageous today.

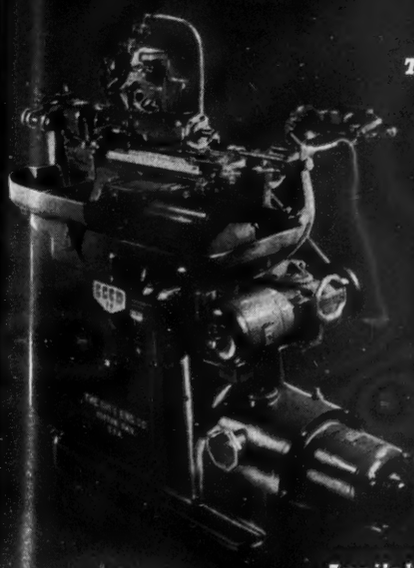
Infinitely variable speed may be secured to any R.P.M. within the range of the unit. The output speed is increased or decreased by variation of the position of the ring on the two driving and two driven cones.



MASTER

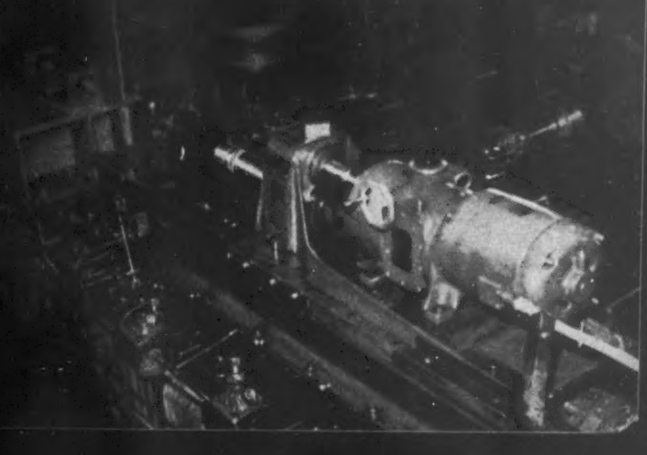
SPEEDRANGER

THE MASTER ELECTRIC COMPANY • DAYTON, OHIO



Save material and save space with the simple compact, integrally built Master Speedranger. The all-metal construction insures greatest possible durability and freedom from service interruptions.

Available in the vast number of types that make up the Master line including the flanged type as shown, also gearhead, unibrake, fan-cooled, explosion-proof, splash-proof, multi-speed, etc.



The PACKAGING INDUSTRY is in the war too!

TRIANGLE AWARDED "E" FLAG FOR EXCELLENCE

THE Triangle Package Machinery Company has been awarded the Army-Navy "E" for especially meritorious production of machinery and special assemblies for vital military purposes. In actuality, the high production standards which earned this coveted honor are the same high standards which Triangle established long ago in the peacetime production of Weighers, Fillers and Carton Sealers.

In order to expedite production of war materials and at the same time maintain a flow of essential packaging machines, Triangle plant facilities have been greatly expanded. After Victory the entire capacity of this plant will be devoted to supplying you with newer and finer packaging machinery than ever before.

Today . . . if you are entitled to preference ratings for package machinery, submit your requirements to Triangle where you can be sure of packaging experience and production excellence second to none

TRIANGLE PACKAGE MACHINERY CO.

922 NO. SPAULDING AVENUE, CHICAGO

IN DEHYDRATION Quality Control Comes 1st

Immediately AVAILABLE

At the present time shipments are assured within 4 WEEKS.

Better Act Now!

BRILSONAIR Conditioning

The *positive* control of the quality and uniformity of your product must be the first and major consideration in the purchase of food dehydration equipment.

Successful control requires 3 all important factors

1. Control of temperature
2. Control of humidity
3. Control of air motion

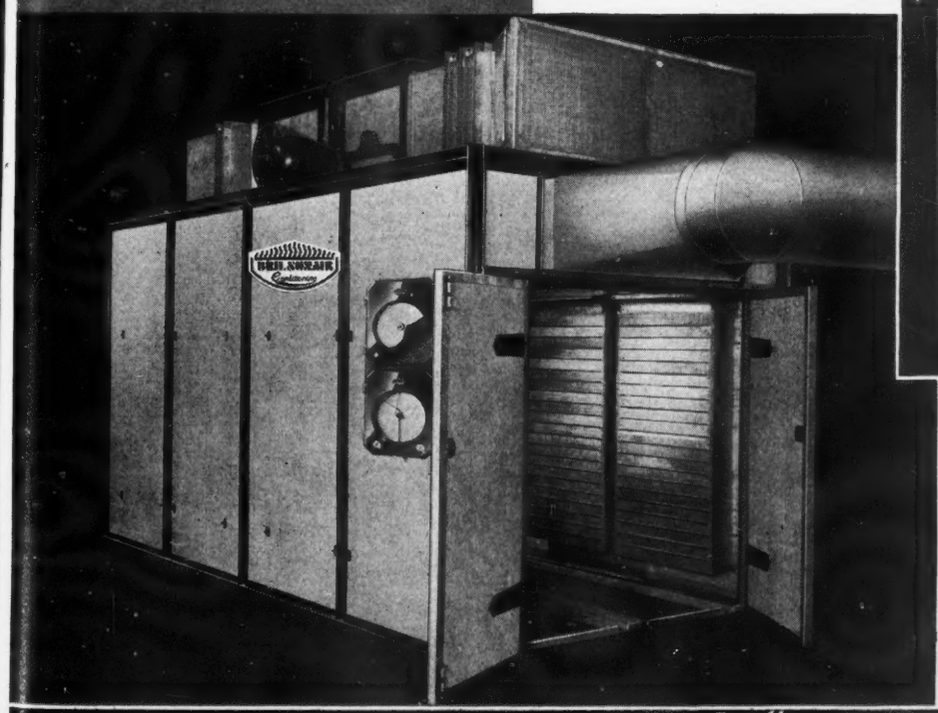
In the Brilsonair Dehydration Process—food processors will find the *positive* method of scientific control—not of one—not of two—but of all three factors.

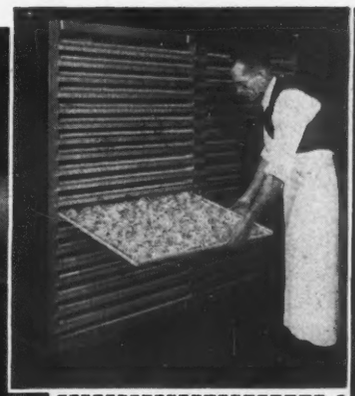
The Brilsonair Duplex C20 (illustrated) is an original scientifically designed unit combining the best features of compartment, tunnel and apron type machines. It is a product of air conditioning engineering. Its mechanical simplicity and fool-proof operation assures continuous controlled quality production.

Get the New Brilsonair Catalog. It takes the mystery out of Dehydration. It shows with diagrams—a set-up for controlled quality production in 2-hour cycles. It is simplified and to the point. Send coupon today for your copy.

BRIDGES-WILSON CORPORATION

206 Mass. Ave., ARLINGTON, MASS.





FILL IN COUPON

Bridges-Wilson Corporation
206 Mass. Ave., Arlington, Mass.

Please send a copy of your new Food Dehydration Catalog.

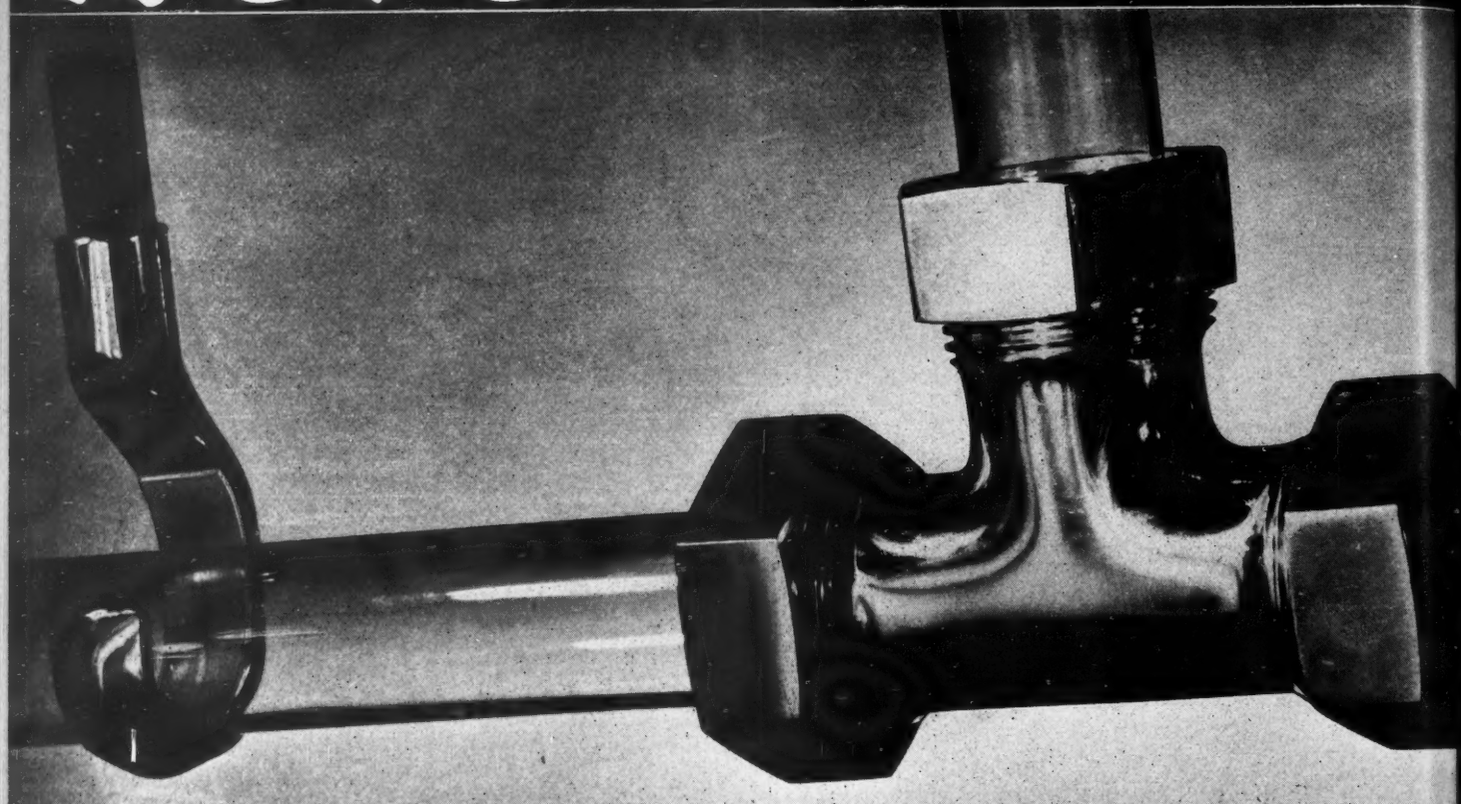
Name .....

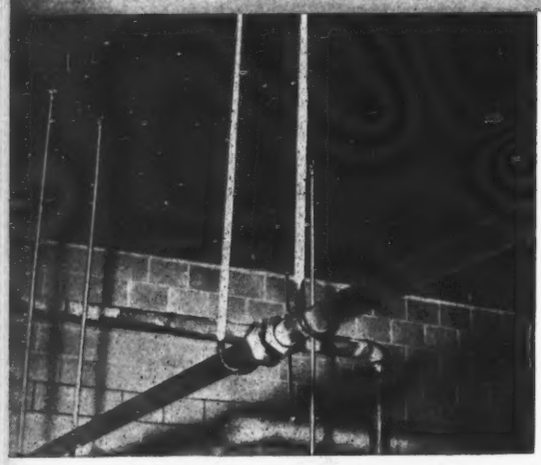
Firm .....

Address .....

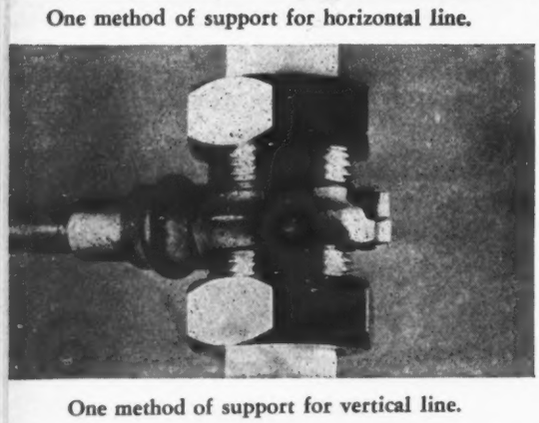
BRILSONAIR for *Flexibility* of PRODUCT · CONTROL · PLANT LAYOUT

Here it is...





One method of support for horizontal line.



One method of support for vertical line.

HERE it is! The glass piping that will solve most of your piping problems–PYREX Piping — the piping that has qualities necessary for an ideal dairy pipe line *plus* visibility. It is well qualified to replace piping metals that have gone to war.

To prove its many advantages, this piping has been tested for nine months in actual dairy service.

For years, the food, chemical, paper, textile, and other industries have been using miles of PYREX Brand Piping to handle such products as soups, meat broths, fruit juices, wines, acids, alkalies, bleaches, dyestuffs. These industries have been able to improve their products and reduce costs with PYREX Piping. Now you, too, can use resistant PYREX Piping to protect the purity of your product and at the same time give you low-cost, long-time service.

IT'S EASY TO INSTALL

This beaded piping has been specially designed for use with your present standard dairy fittings. Strong joints are easily made with the following parts: a small molded rubber gasket that fits snugly over the beaded end of the glass pipe; a plastic follower ring; and your standard fittings. (See illustrations). PYREX Beaded Piping is easy to install, and it can be quickly assembled and taken down without wrenches. It is available in straight lengths that connect with your present metal fittings, such as elbows and tees. Standard stock lengths are 5 ft., 6 ft., 8 ft. and 10 ft. Sizes are 1½ in. and 2 in. diameter. If you need special lengths, your jobber can cut and bead them for you.

COSTS LESS

The initial cost of PYREX Beaded Piping is substantially less than that of the piping you are now using, and in other industries its long life has established a lower overall cost than that of any other material available for similar service!

MECHANICAL STRENGTH

Glass piping is not as strong as the metal pipe you now use, but experience has

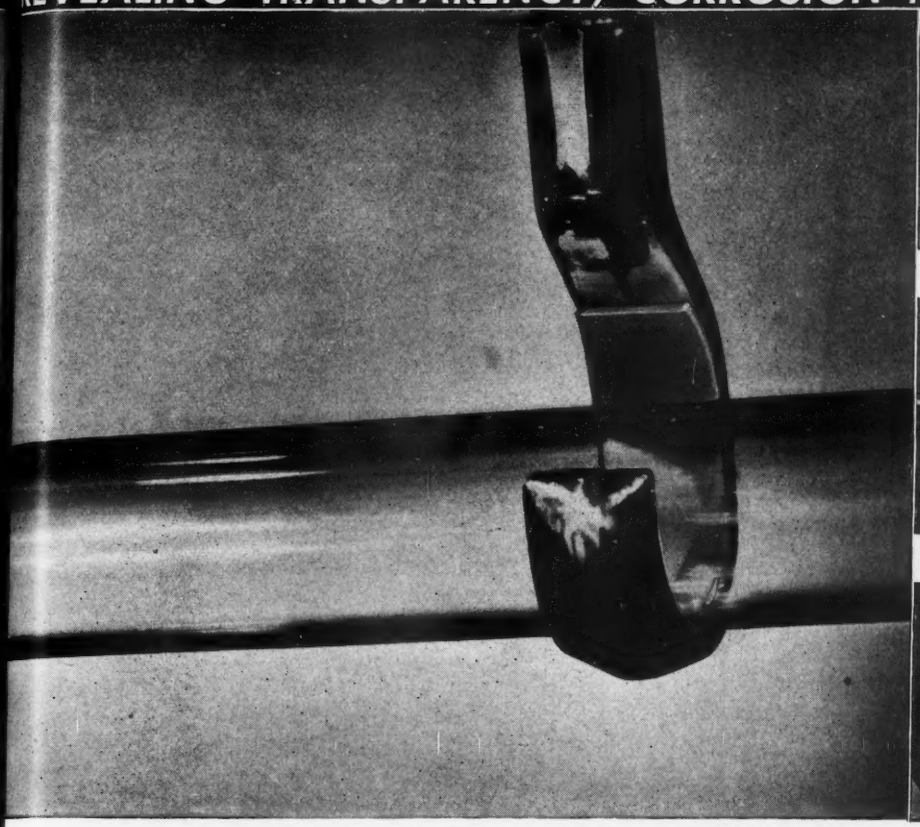
"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works, Corning, N. Y.

CORNING
Glass Works
Corning New York

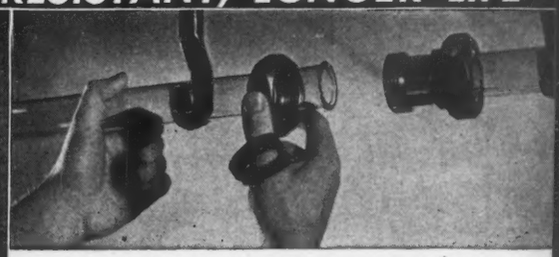
Pyrex Industrial Glass
BRAND

GLASS PIPING FOR DAIRIES

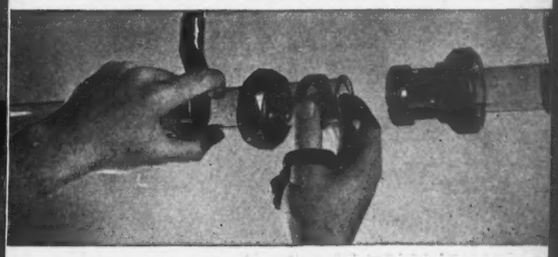
EASY TO INSTALL, LOWER INITIAL COST, SANITARY, EASY TO CLEAN REVEALING TRANSPARENCY, CORROSION RESISTANT, LONGER LIFE



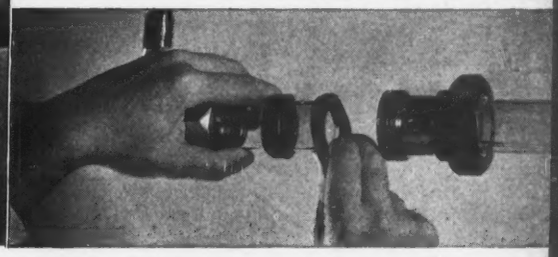
PYREX brand Glass Beaded Piping attached to standard No. 7 tee. Note method of support and pads to protect glass from metal hangers.



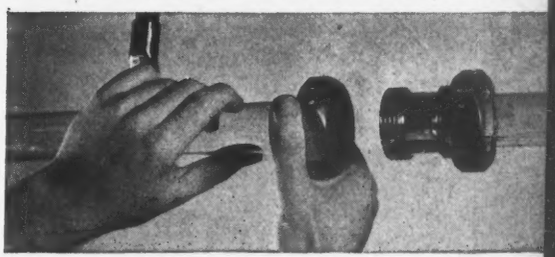
This shows the 13H nut being slipped over the glass tube.



Then the split follower ring is snapped over the beaded end.



Finally the molded rubber gasket is mounted on the bead.



The nut and follower ring are then slid forward.

The nut is then drawn up on the male thread of the connection. Nuts should be drawn tight by hand only.

definitely proved that dairy workmen readily learn to handle and assemble it without breakage. When only reasonable care is exercised, breakage is *not* a problem.

PYREX Beaded Piping can be used on hydrostatic pressures up to 40 lbs. per sq. inch. This includes an adequate safety factor.

EASY TO CLEAN AND STERILIZE

The problem of cleaning is greatly simplified with this glass piping because it is easier to clean than any metal piping you have ever used. You know how easy it is to clean milk bottles. It is even *easier* to clean PYREX Piping, because the surface is harder and has less tendency to retain milk deposits. And because PYREX brand glass resists the shock of sudden temperature changes, it can be flushed with hot water or live steam without danger of breakage, even immediately after flushing with cold water.

REVEALING TRANSPARENCY

One of the most important features of glass piping is the transparency which reveals the condition of the pipe line as well as the contents. This visibility means that you can see when the pipe is clean; you can see when the milk, sterilizing water, or cleaning solution starts going through the line, and when it is completely drained from the line. You can readily tell whether air is being sucked into the joints or whether valves are leaking. You, at all times, have a visual check on what is happening inside these glass pipe lines. This one feature alone can save many operation interruptions.

LONG LIFE

Another important advantage of PYREX Piping is its resistance to the attack of corrosive liquids. After several months of continuous operation, PYREX Dairy Pipe Lines showed no evidence of corrosion by cleaning solutions. You can't harm this glass with strong alkaline cleaning waters. It will not etch like bottle glass.

For complete details on PYREX Piping for your dairy, get your copy of the new bulletin "Glass Piping for the Dairy." You can obtain it from your jobber or by sending the coupon direct to Corning Glass Works, Industrial Division, Corning, N. Y. Branch Offices: New York, 718 Fifth Ave. Chicago, Merchandise Mart.

CORNING GLASS WORKS
INDUSTRIAL DIVISION
Corning, N. Y.

Please send me the new bulletin entitled "Glass Piping for the Dairy."

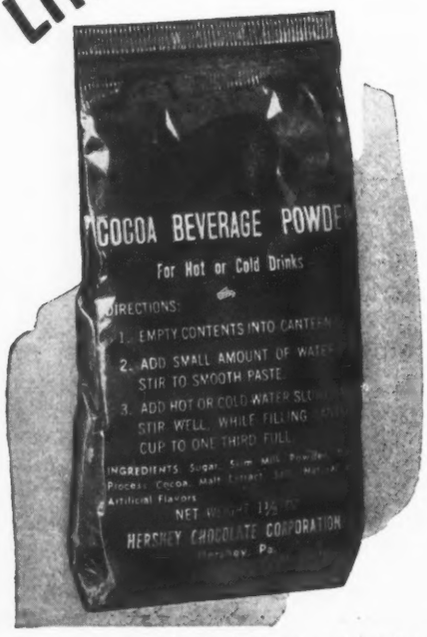
Name.....

Title.....

Firm.....

Address.....

TOUGH
LIKE THE FIGHTERS IT WAS MADE TO SERVE



This tough little field ration container passed its "physical." It was inflated, heat-sealed, beaten and generally mistreated. It came through —full of fight—and that's why these U.S.E. Airtite Bags of special heat-sealing, moisture-proof cellophane with perma-tite seams are providing protection and comfort for our fighting men in some of the wettest, hottest hell-holes in the world!

U.S.E. makes these moisture-proof envelopes for such foods as nutritious cocoa beverage and hunger-satisfying Army Field Ration D. U.S.E. also makes special envelopes for wound-healing sulfa drugs, health-insuring salt tablets, toilet paper, and other forms of containers and covers: for bayonets, airplane motor parts, etc. These U.S.E. protective packages are handy, dependable, lasting: the sort of protective packaging you may need for your goods after the war!

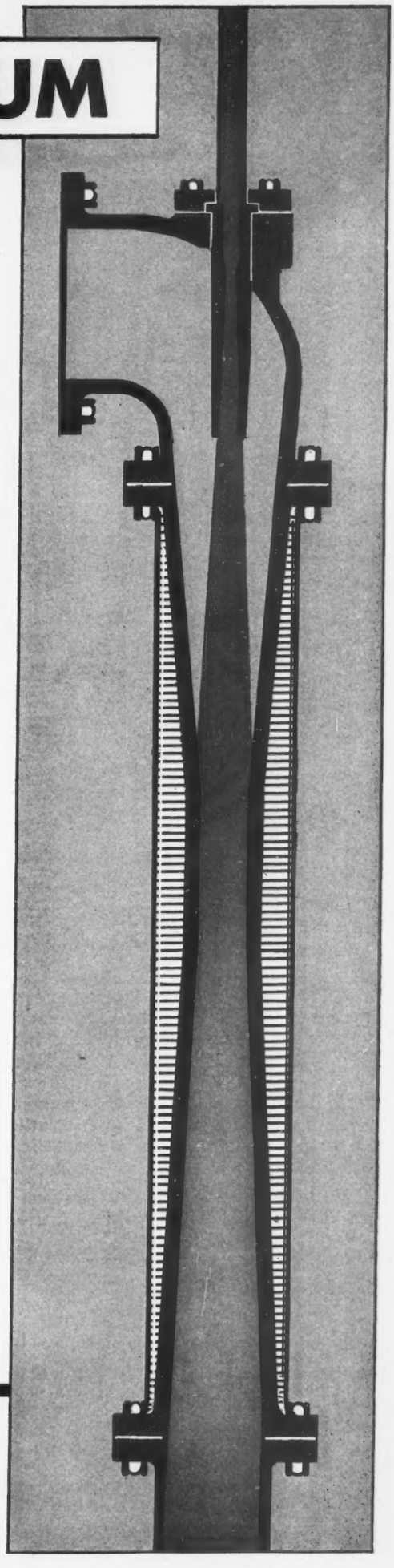
UNITED STATES ENVELOPE COMPANY
Container Division
SPRINGFIELD, MASSACHUSETTS

U·S·E *protective packaging*

Products of United States Envelope Company include TRANSPARENT CONTAINERS • MOISTURE-PROOF BAGS ENVELOPES • WRITING PAPER • NOTE BOOKS • PAPER CUPS • TOILET TISSUE • PAPER TOWELS

JETS FOR VACUUM

INGERSOLL-RAND STEAM-JET EJECTORS ARE PARTICULARLY SUITABLE FOR PROCESS APPLICATIONS



Ability to handle wet or dry mixtures—I-R Steam-Jet Ejectors handle wet or dry air and gases, and any mixture containing slightly sticky or solid materials, such as chaff, dust, etc. Ejectors can be made of suitable materials to handle high-temperature or corrosive gases. Accidental entrainment of liquid will not damage an ejector.

Any vacuum—Ejectors are available for any vacuums up to, or better than, 29.9″ Hg. (0.1″ Hg. Abs.) Ejectors termed "thermal compressors" are available for boosting steam at pressures above atmosphere.

Any capacity—There is an unlimited range of standard I-R sizes, types and ejector elements to economically meet any capacity requirement.

High efficiency—The design of I-R Ejectors is based on facts accumulated from laboratory and field tests and is proven by thousands of successful installations.

Sustained efficiency—With I-R Steam-Jet Ejectors there are no moving parts to wear out or require lubrication.

Operating stability—Conservative design factors assure satisfactory performance under all operating conditions.

Silent operation—No moving parts, no noise, no vibration—nothing to be adjusted or replaced.

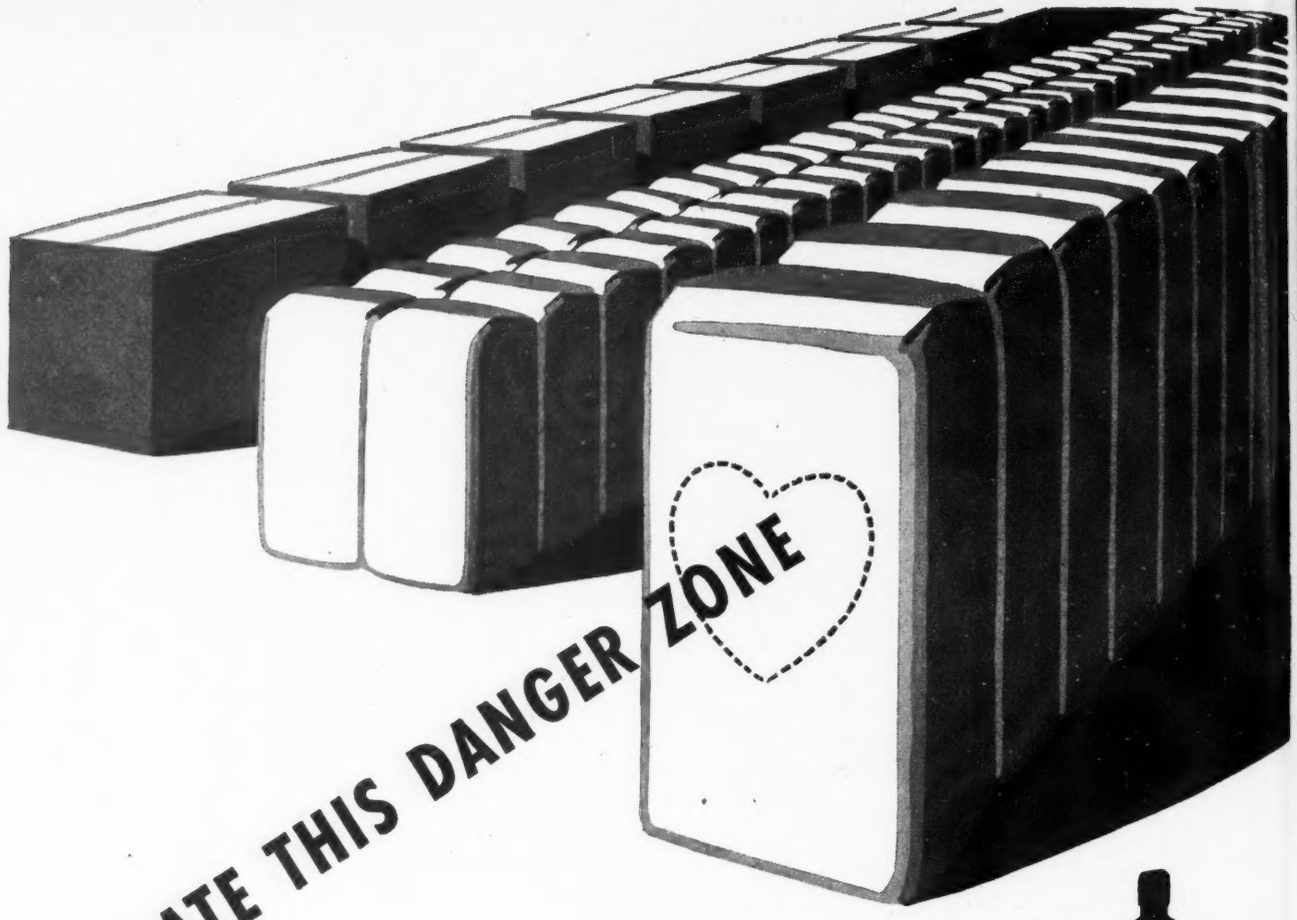
Low installation cost—Little or no foundation is required. Only a small space is needed to install ejectors of large capacity.

Easy to operate—An experienced operator is not required to operate I-R steam-jet ejectors.

Long life — Low maintenance — I-R Ejectors have been designed for long life and low maintenance. Proper materials are recommended by experienced metallurgists. Every I-R ejector installed is backed by I-R service.

Ingersoll-Rand

4-233 **11 BROADWAY, NEW YORK, N. Y.**



Complete Fumigation Assured with Methyl Bromide

Methyl Bromide packs a penetration punch that reaches to the center of every bag and package. This penetration, not found in ordinary fumigants, has been proved time and again in tests and actual use. It is a fact of far-reaching importance, for as food producers know, unless a fumigant possesses penetrating powers effecting a *complete kill*, it has little or no value.

Methyl Bromide kills every stage of insect life from egg to adult—in the "Danger Zone" at the heart of box car loads, in the center of large warehouse stocks, *and will even penetrate to the very center of 140-lb. bags of flour!*

In addition to this outstanding quality, Methyl Bromide is exceptionally easy to use. Complex and expensive equipment is unnecessary, for Methyl Bromide is applied direct from convenient cylinders or handy 1-lb. cans. It is used extensively in mills, warehouses, food processing plants, vaults and, under special conditions, for box car and outdoor tarpaulin fumigations.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

New York • St. Louis • Chicago • Houston • San Francisco • Los Angeles • Seattle

METHYL BROMIDE

THE PENETRATING FUMIGANT

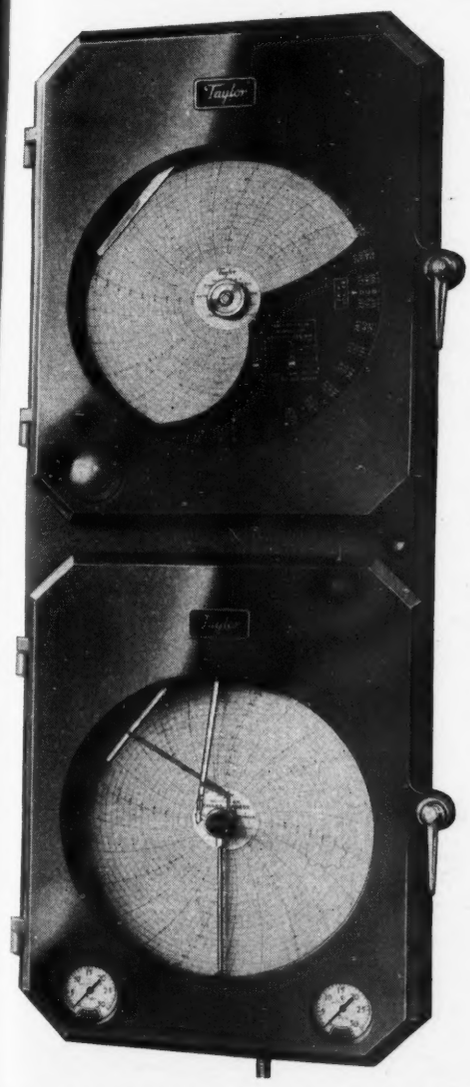
DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

How not to dehydrate

Dehydration Attempt Causes Home Blaze
A housewife's attempt to dehydrate pears resulted in a $100 fire in her home at [redacted] yesterday afternoon, Battalion Chief [redacted] reported. Mrs. [redacted] the chief said, cut up the pears and placed them in a basket over the furnace. She called firemen after the basket caught fire and flames spread to the cellar ceiling.

STOP! We don't mean to imply you'll set your plant on fire if you attempt dehydration without the help of Taylor Instruments. But we do mean that dehydration is an altogether different thing from natural drying or canning, either in tin or in glass. And you can be saved a lot of costly grief if you start out with the right kind of automatic control.



How to get the best results

LOOK the field over carefully, select the type of dryer that best suits your purpose—tunnel, compartment, continuous, or rotary. Then ask the dryer manufacturer to supply it ready-equipped with Taylor Instruments. Taylor has been in dehydration since it started, and we've already designed complete Taylor Control Systems for almost every dryer on the market. Your Taylor Field Engineer will be glad to give you the whole story. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Instruments for indicating, recording, and controlling temperature, pressure, humidity, flow, and liquid level.*

★

KEEP ON BUYING U. S. WAR BONDS AND STAMPS

★

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

"Little Major" Marches ahead in Cellophane

and saves vital metal for war!

Before. **Ninety-six tin cans required to package 36 quarts of cocktail juice. Shipping weight is 103 lbs.**

After. **No metal required when dehydrated and packed in Cellophane bags. Equivalent of 36 quarts weighs only 2¼ lbs.**

WARTIME brought about the conversion of this carrot juice cocktail from liquid form in metal containers to dehydrated form in specially made printed bags of Du Pont Cellophane.

But the new product is actually a big improvement in merchandising and distribution, according to P. D. Ridenour Sales Co., of Chicago, effecting a tremendous saving in shipping space and weight, in addition to the metal itself.

If you have a metal replacement problem, let us work with you. E. I. du Pont de Nemours & Co. (Inc.), Cellophane Division, Wilmington, Delaware.

DU PONT

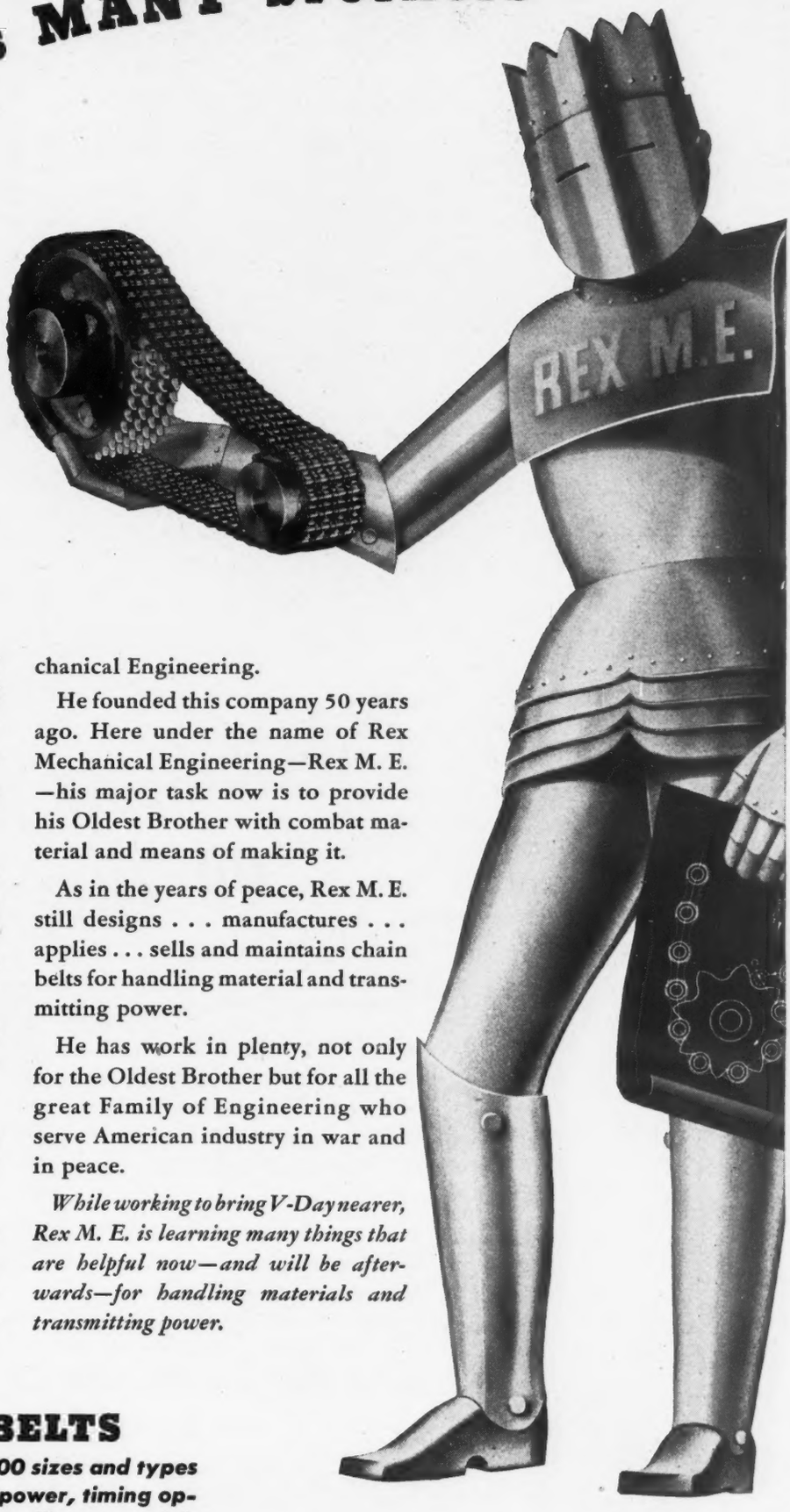
REG. U. S. PAT. OFF.

Cellophane

Better Things for Better Living

. . . Through Chemistry!

He helps his MANY brothers



HE BELONGS to a large family of wonder workers. They are men of faith who perceive not only the difficulties, but ways to surmount them.

The Oldest Brother of the family is more than 5000 years old.

His business is to destroy—from as far off as he can, as swiftly as he can, while keeping his own as safe as he can. His inventions are marvels of speed and might.

He is now more active than ever before. His name is Military Engineering.

A Younger Brother works on the machines of destruction and in the factories that make them.

He is a youngster, something over a century old. He built the steam engine, machine tools, the internal combustion engine. His name is Mechanical Engineering.

He founded this company 50 years ago. Here under the name of Rex Mechanical Engineering—Rex M. E. —his major task now is to provide his Oldest Brother with combat material and means of making it.

As in the years of peace, Rex M. E. still designs . . . manufactures . . . applies . . . sells and maintains chain belts for handling material and transmitting power.

He has work in plenty, not only for the Oldest Brother but for all the great Family of Engineering who serve American industry in war and in peace.

While working to bring V-Day nearer, Rex M. E. is learning many things that are helpful now—and will be afterwards—for handling materials and transmitting power.

REX **CHAIN BELTS**

In more than 2000 sizes and types for transmitting power, timing operations, and handling materials

CHAIN BELT COMPANY OF MILWAUKEE

Put a stop watch on this operation

Unless up to fifty packages pass a given point on your production line every minute, chances are you could speed up packing with the Deltaseal system.

Efficient Bemis Deltaseal machines shape and seal Deltaseal Bags automatically and at speeds to coordinate with other plant operations.

And Deltaseal paper bags with their easily formed pouring spout and attractive brand printing are real salesmen for the products they carry.

BEMIS BRO. BAG CO.

Headquarters for the

DELTASEAL System of PACKAGING

Minneapolis, Minnesota

OFFICES: Baltimore • Boston • Brooklyn
Buffalo • Charlotte • Chicago • Denver
Detroit • E. Pepperell • Houston
Indianapolis • Kansas City • Los Angeles

Louisville • Memphis • New Orleans • New York City • Norfolk • Oklahoma City
Omaha • Peoria • St. Louis • Salina • Salt Lake City • San Francisco • Seattle • Wichita

Customer satisfaction and the use of Cuno "Filter-Fine" Strainers are definitely related.

Your Cuno-filtered product is free from impurities or undesirable coarse particles — for example, in fruit juices the pulp or skin is removed, but the beneficial smaller particles such as the tasty "buds" and fine pulp which increase both the food value and customer appeal, are retained in the fruit.

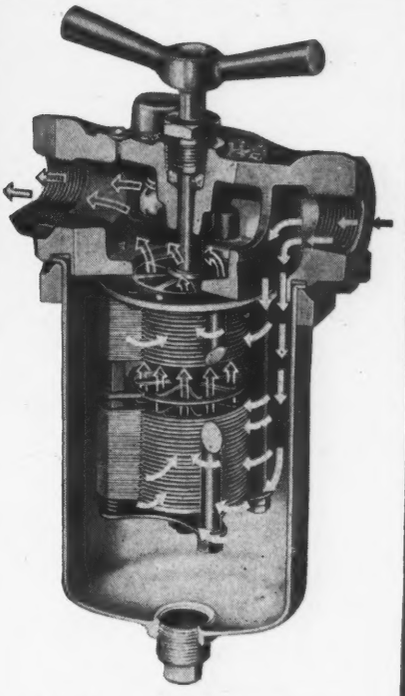
For the food industry, Cuno has designed filters which will strain out all particles larger than specified, the smaller ones remaining in the fluid.

Besides, Cuno Auto-Kleans are trouble-free. Unlike a wire screen strainer, the element is non-collapsible — there's no danger of an accident permitting dangerous or unwanted particles getting through.

Don't risk your product's reputation with haphazard straining. Protect it this easy, low-cost way.

Non-Stop Straining Saves You Time and Money

Here's another real advantage of the Cuno Auto-Klean. You never have to interrupt flow to clean or replace a clogged filter element — a turn of the handle (by hand or motor) *combs out* embedded solids. And pressure drop is much less than with wire screen strainers. Use the coupon below for "Quick Facts" — today!



CUNO AUTO-KLEAN will protect these products from foreign solids

- Baby Foods
- Molasses
- Jellies and Preserves
- Candy
- Salad Dressings
- Cocoa Butter
- Oleomargarine
- Fruit Juices and Syrups
- Tomato Catsup
- Peanut Products
- Chocolate
- Lard Compounds and Substitutes
- Mustard

KEEP FLOW ON "GO" WITH

CUNO

THE "FILTER-FINE" STRAINER

CUNO ENGINEERING CORPORATION
403 South Vine Street, Meriden, Conn.
Send me the free booklet, "Quick Facts"
NAME .....
COMPANY .....
ADDRESS .....
Product to be strained .....

A "Natural" for the Shortage of Separate B Complex Factors

FLEISCHMANN'S BEE-FLEX

TYPE 321

A natural B Complex powder composed of primary grown Pure Dry Brewers' Yeast and a riboflavin concentrate derived from corn.

Hundreds of thousands of pounds of Fleischmann's Bee-Flex Type 321 have been sold in the past few years. With industry faced with acute shortages of B Complex factors, we suggest that you investigate this *natural product* in order to protect yourself against possible shortages.

WE'RE CELEBRATING THE 3RD ANNIVERSARY OF THE INTRODUCTION OF FLEISCHMANN'S BEE-FLEX TYPE 321

FLEISCHMANN'S BEE-FLEX TYPE 321

Vitamin Potencies Per Gram as Determined by the Fleischmann Laboratories:

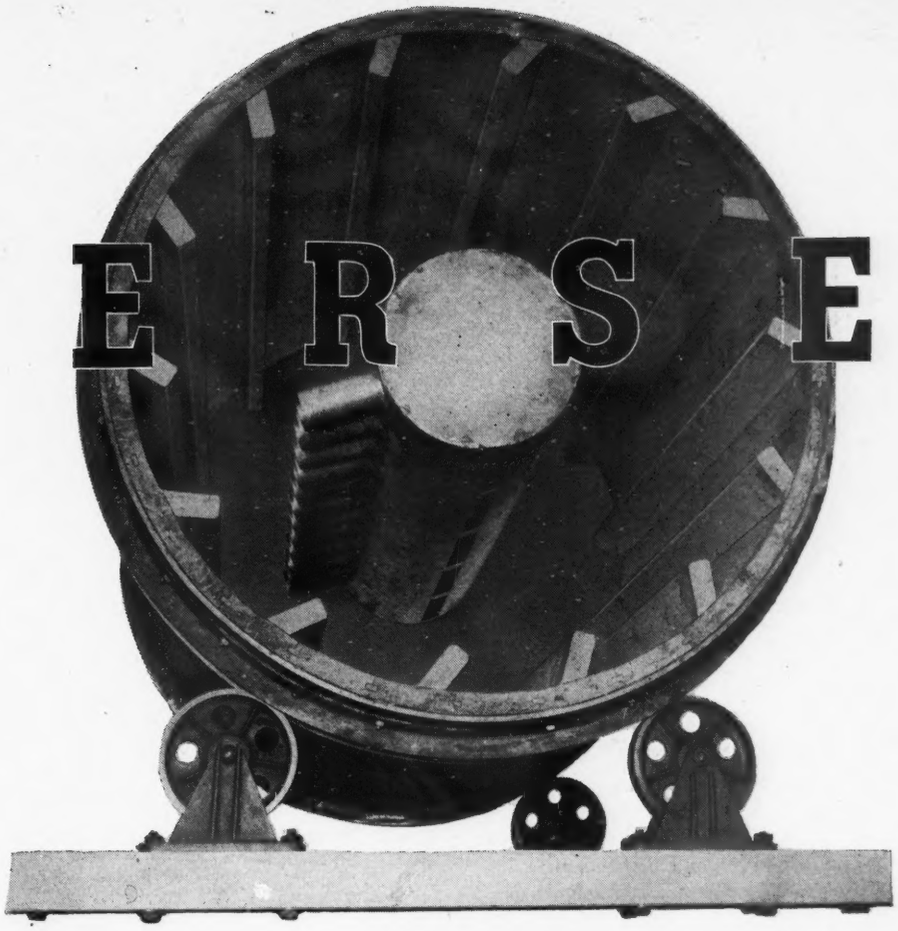
Thiamine (B_1)	170 I. U.	*Plus*	Niacin (Nicotinic acid)	500 micrograms
Riboflavin (G)	500 micrograms		Pyridoxine (B_6)	85 micrograms
			Pantothenic Acid	230 micrograms

and all the other known and unidentified members of the Vitamin B Complex natural to yeast.

STANDARD BRANDS INCORPORATED

Pharmaceutical Division — *595 Madison Avenue, New York, N. Y.*

H E R S E Y



A VEGETABLE DEHYDRATOR

THAT IS

CONTINUOUS IN OPERATION taking the product in continuous flow from the last washer and discharging without further attention to the packaging room

COMPLETELY AUTOMATIC in movement of product, temperature control and cycle time **NO OPERATORS NEEDED**

UNIFORM TREATMENT because the product is in motion and is being turned over constantly every particle receives exactly the same treatment

CONSTRUCTED OF

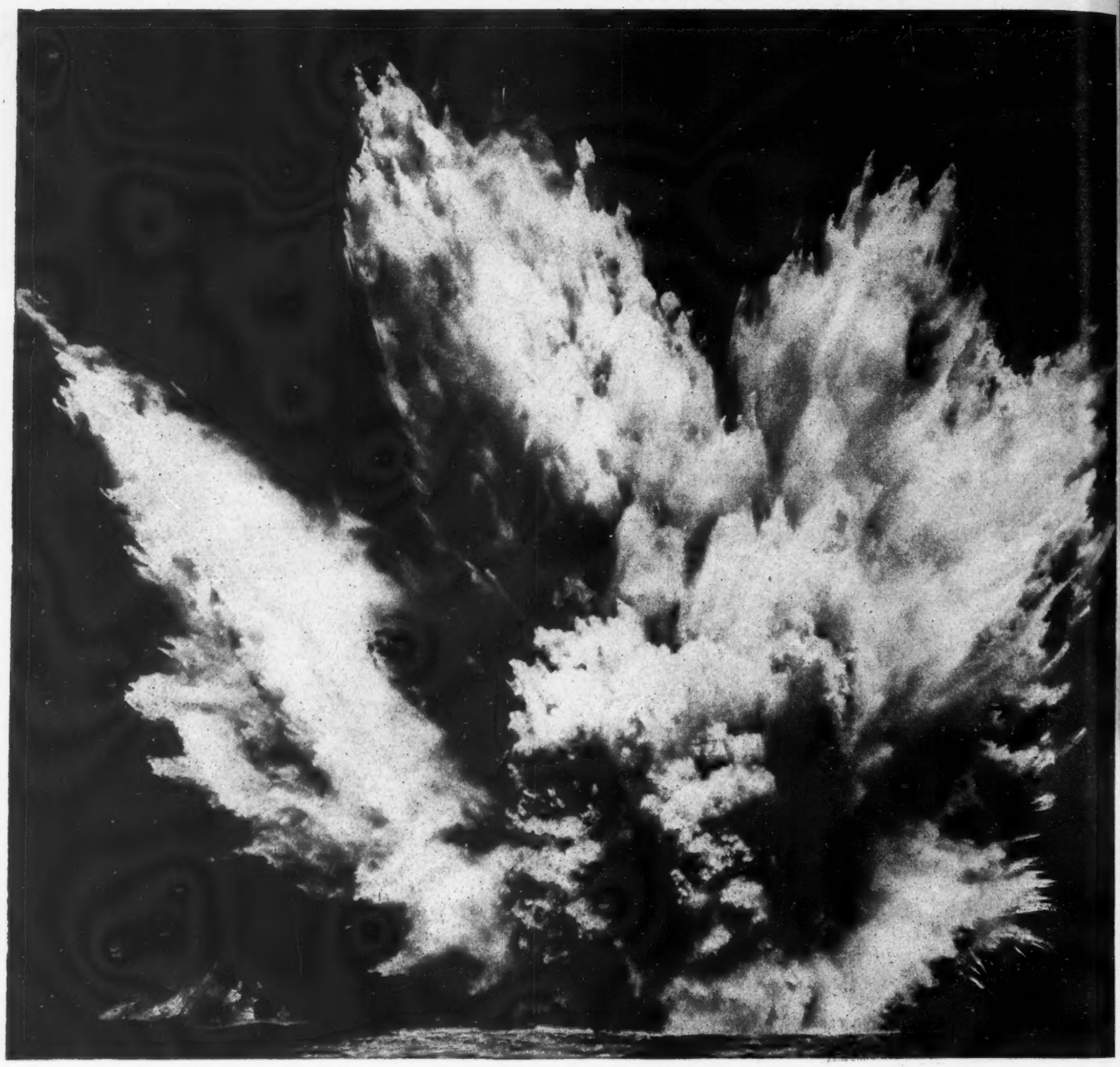
NON-STRATEGIC MATERIALS such as wood, cast iron, etc., wherever possible

Send for Catalog Today

HERSEY MANUFACTURING CO.

DRYING ENGINEERS FOR MORE THAN 60 YEARS

381 E STREET • SOUTH BOSTON, MASS.



Air Conditioning gives it OOMPH!

This war is being fought with *explosions*. All kinds... from block-busters to hand grenades. And don't forget the explosions in the barrels of guns that propel bullets and shells toward the enemy.

It takes a lot of skill to make a good explosion. Air conditioning helps.

The rate at which powder *dries* determines the way it explodes. It must not explode too soon or too late. Hence, special air conditioning . . . with temperature and humidity controlled precisely . . . is used for the drying of powder.

Also, air conditioning protects the lives of workers in munitions plants by providing the safest temperature and humidity conditions.

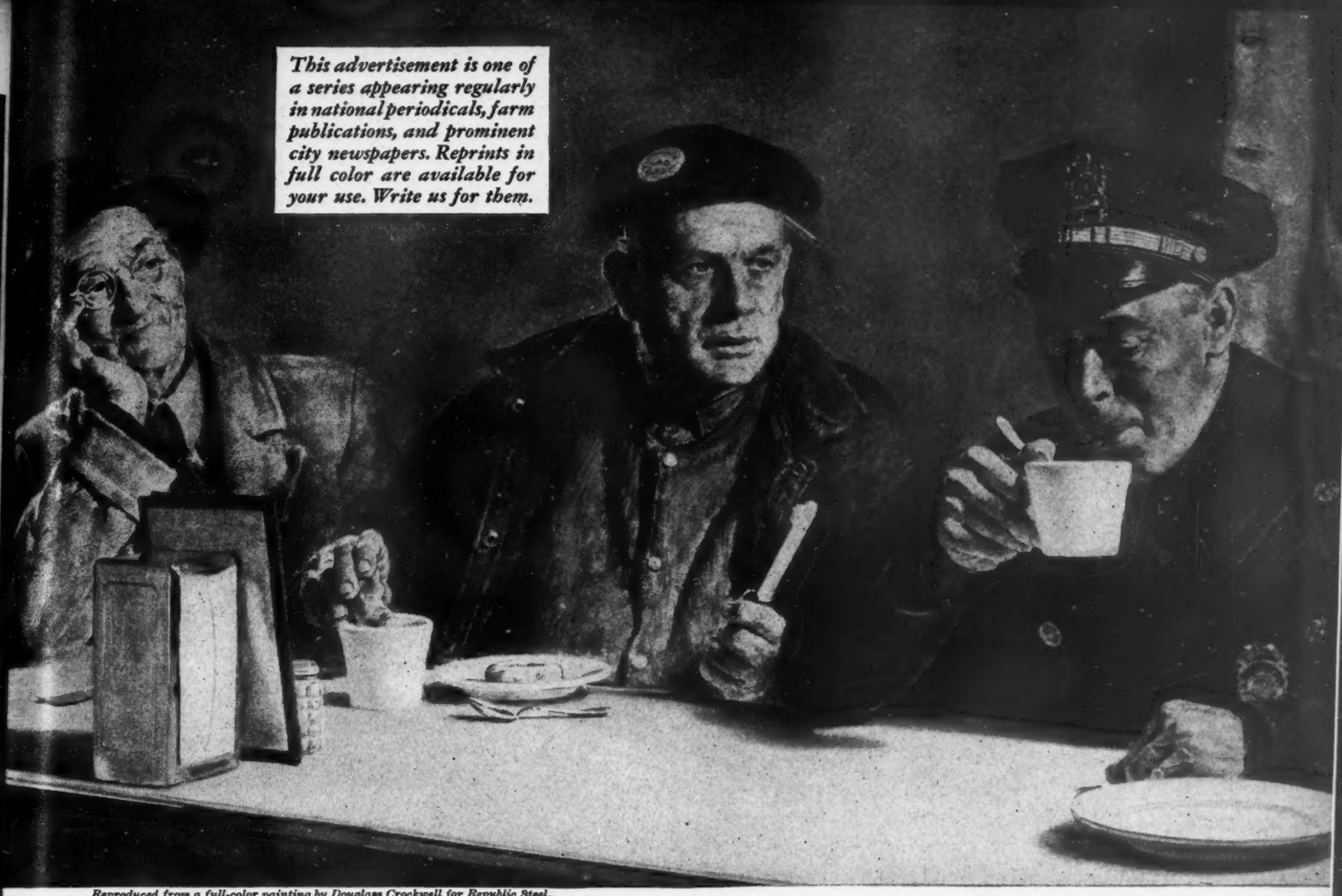
General Electric is an outstanding supplier of the new improved kind of air conditioning equipment needed for these wartime requirements. It has developed equipment more flexible, more compact than ever before . . . with more accurate temperature and humidity control.

Today this equipment is being devoted to winning the war. After the war, a far better air conditioning will be made available for offices and factories, stores and theatres; homes, hospitals and hotels . . . from General Electric.

Air Conditioning and Commercial Refrigeration Department, Division 433, General Electric Co., Bloomfield, N. J.

Air Conditioning by **GENERAL ELECTRIC**

This advertisement is one of a series appearing regularly in national periodicals, farm publications, and prominent city newspapers. Reprints in full color are available for your use. Write us for them.



Reproduced from a full-color painting by Douglass Crockwell for Republic Steel.

"Now . . . if I was down there in Washington . . ."

That's Joe talking. Every night when he stops in for his coffee and sinkers he has plenty to tell the boys about how this war should be run. Maybe he's right and maybe he isn't.

The important thing is that he can say what he thinks—out loud. Right in front of Tom Burke, the cop. He couldn't do that in Germany or Japan or Italy . . . or in any of the nations that have been "liberated" by the New Order.

But Joe is an American.

★ ★ ★

And because Joe is an American, he has more privileges—*and more opportunities*—than can be found anywhere else in the world.

If he doesn't want to work for somebody else, he can operate a business of his own—anywhere. Joe is a free agent. His future is under his hat. Like millions of other Americans on the way up, Joe can cash in on a way of life that has brought America the highest standards of living in the world—by a big margin.

It is a typically *American* way of life—based on American ingenuity, ambition, desire to get ahead. It gives every person a chance.

That is why today, after a comparatively short time, teamwork and cooperation in American industry and American agriculture are performing miracles of production that would be impossible in a country weakened by years of regimentation and dictatorship.

That is why the steel industry—in which Republic holds a leading position—has been able to "come through" with the steels and steel products for our Nation's gigantic armament and shipbuilding programs. In 1942 Republic operated at 99.5% of capacity for the entire year. And the nearly 70,000 Republic men and women supporting our fighting forces* beat the 1941 record by 479,000 tons.

That, too, is why Republic chemists, metallurgists and engineers are constantly searching for—and finding—new and improved ways of making finer steels.

And that is why you can look with faith to the future—when victory will insure our *free* way of life—when you and we can return to the job we want to do most—produce peacetime products to make America a better, happier, safer place in which to live.

Until then, we have a big job to do. LET'S DO IT WELL and get it finished in a hurry. And let's guard faithfully our American way of life!

**Over 13,000 Republic men are now in uniform.*

REPUBLIC STEEL CORPORATION

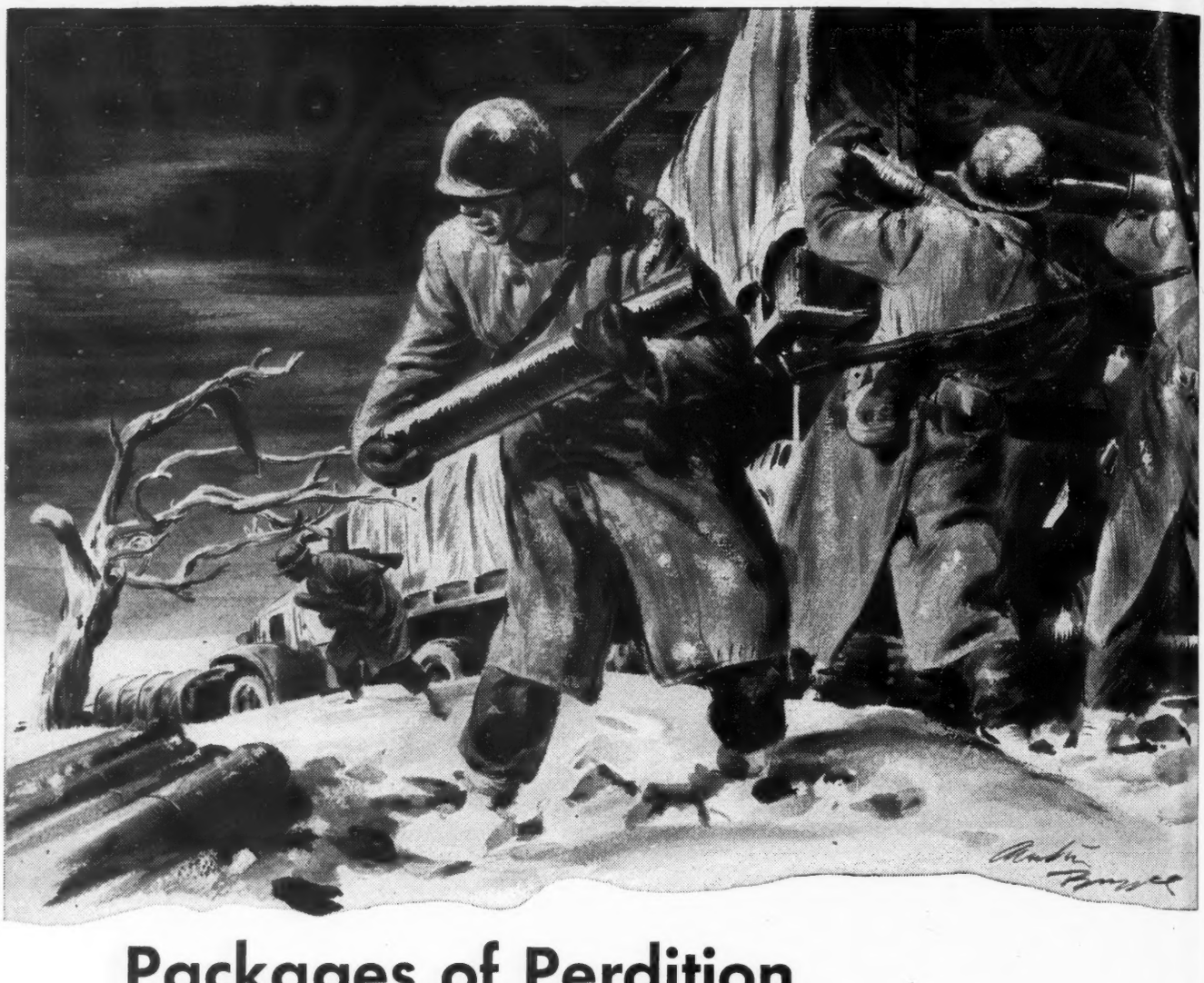
General Offices: Cleveland, Ohio

Berger Manufacturing Division • Culvert Division
Niles Steel Products Division • Steel and Tubes Division
Union Drawn Steel Division • Truscon Steel Company
Export Department: Chrysler Building, New York, N.Y.

Republic

ENDURO STAINLESS STEEL

Sheets, Plates, Roofing, Pipe, Upson Bolts—Nuts—Rivets,
Electrunite Condenser and Heat Exchanger Tubes.

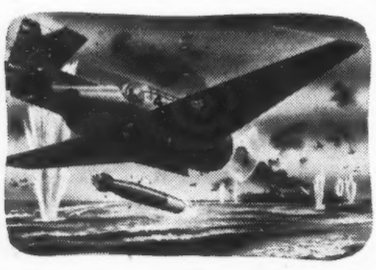


Packages of Perdition

HIGH EXPLOSIVE SHELLS can't be treated like cord wood. They must be securely protected against damaging knocks and bumps.

Their delicate timing mechanisms, fuses, and primers must be guarded from rain, snow, dust and dirt. That's why shells are safely packed in sturdy fibre containers . . . real packages of perdition.

To make these protective cylinders, the United States Government turned to the American Can Company—the company which designed and developed the shell container used during the last war. So, in 1942, Canco formed a wholly owned subsidiary company—The Ammunition Container Corporation—and again went to work manufacturing shell containers. We are proud to report that this organization is now producing vast quantities of these vital "packages of perdition" to meet Army demands.



We work for *all* the Services

Canco is also turning out millions of other containers for all branches of the service . . . containers for everything from hermetically-sealed combat dressings to ham and eggs, and T.N.T. Even our machine shops are now producing specified tools of war.

Another Canco subsidiary, The Amertorp Corporation, is working exclusively for the Navy—making those incredibly complicated weapons of destruction: Torpedos.

Naturally, all of these vital war products consume tremendous quantities of metals and other materials, which formerly were serving you.

We are fully aware of the problems which you—the manufacturer—face, and we want to assure you that we are doing everything possible to provide substitute containers from materials now available. But, while the war lasts, Canco—like most other companies—must place war needs and Victory first.

AMERICAN CAN COMPANY
230 PARK AVENUE, NEW YORK, N. Y.
and subsidiaries
The Amertorp Corporation
The Ammunition Container Corporation

Textiles—in War as in Peace

World's oldest industry performs modern miracles

WITH ever quickening tempo the friendly hum of the spinning wheel has echoed down the centuries—symbol of a mighty industry.

Its hum is heard today above the din of war.

Capt. Rickenbacker heard it as the lives of his party depended upon a thickness of rubberized fabric.

The hard-pressed soldier on a far-off Pacific isle hears it when he sees fresh supplies and ammunition descending from the sky via friendly parachute.

Adolf Schickelgruber hears it when winter joins forces with the enemies of his ill-clad armies and hastens the day of his defeat.

Yes, man is dependent upon textiles from the cradle to the grave—in peace and in war.

In peace man demands comfort and beauty. In war he must have comfort and protection. The textile industry is coming up to these expectations.

It is developing hundreds of special fabrics for special purposes. It has created clothing for wear, miles high in the stratosphere, and fathoms deep under the sea, clothing to meet the daytime heat of the desert and the bitter cold of its nights, clothing for the tropics and the Arctic, the swamps and mountains—for every climate and every condition.

This is the ninth of a series of editorials appearing monthly in all McGraw-Hill publications, reaching more than one and one-half million readers, and in daily newspapers in New York, Chicago and Washington, D. C. They are dedicated to the purpose of telling the part that each industry is playing in the war effort and of informing the public on the magnificent war-production accomplishments of America's industries.

Modern scientific warfare has forced the development of textiles that were not even thought of a year or two ago: camouflage nets; strong, light, wind-resistant Nylon tentings for the Arctic; heavy Nylon rope for glider towing; parachutes and parachute shrouds; self-sealing gas tanks; panzer hangars; cartridge and powder bag cloths; helmet linings; gas masks; fuses; canvas tops; windshield fabrics and seat upholstery for jeeps, trucks and other motorized equipment; uniforms for all armed services and for nurses, WAACS, WAVES, SPARS and MCWRS. Then there are windbreakers, raincoats, ski-troop uniforms and other items two numerous to mention. The Star Spangled Banner itself is a textile.

The Quartermaster Corps alone has issued specifications for over 300 different fabrics! Add to this the requirements of the Navy, the Air Forces, the various Civilian Defenses, the Red Cross and Lend-Lease and the sum total of textiles required for military and allied uses is approximately 70% of the total produced before the war to meet civilian requirements!

How the textile industry has been able to meet this unprecedented war demand, superimposed upon the industrial and essential civilian needs, is an inspiring story.

First, it stepped up its production to an all-time high. *Textile World's* index of textile-mill activity records three successive records for 1940, 1941 and 1942, the period covering the defense program and the first year of the war. This index for 1942 stood at twice that of an assumed "normal" year. It is noteworthy that this was accomplished mainly with existing equipment.

Second, the textile industry did a job of plant-conversion which was a masterpiece of intra-industry cooperation and idea-sharing.

Third, its technicians developed new and superior fabrics and finishes. Its engineers and production men increased the speed and the efficiency of the entire production machine.

How well all this was done becomes evident when we consider the obstacles to be overcome. Imports of critical fibres have been cut off. There is a shortage of certain chemicals and dyes. There is a high rate of turn-over in manpower and a shortage in experienced labor. It is increasingly difficult to secure machines and repair-parts—just to mention a few of the major problems.

But the textile industry delivered. It has built up an adequate reserve for our rapidly expanding armed services. It is helping to supply the armies of our allies. It is providing for our civilian population . . . all without giving the war leaders a single moment of serious worry.

Major General Edmund B. Gregory, Quartermaster

General of the United States, in special statements prepared for *Textile World*, and in addresses before textile groups, has stated that the cooperation of the textile industry has been outstanding and that the industry has kept ahead of schedule on all the major types of fabrics required.

General Gregory recently pointed out that of the approximately 234,000,000 yards of combed twill produced in this country in 1942, the Army took about 87%, the Navy 10%, leaving 3% for non-military purposes.

Col. Robert T. Stevens, of the Quartermaster Corps, in a recent address, referred to the output of duck. Production of that vital military fabric was twice doubled in six months, between January and July 1942, he said, and an annual capacity of 600,000,000 yards of all types of duck was made available. "The current rate of production of cotton duck is five times normal," said Col. Stevens, "and 38% comes from converted carpet, plush and upholstery mills. Based upon known requirements, production in this field is fully adequate".

"Fully adequate" is high praise when it refers to duck production. At the outbreak of the war it looked as if there was no possible chance of meeting requirements, at least during the first year. Nor would there have been if other types of mills had not shifted to making this fabric, and if experienced duck manufacturers had not gone "all-out" in teaching the newcomers, potential post-war competitors, everything they knew about the manufacture of duck. American industry offers many such examples of unselfish cooperation.

Another outstanding accomplishment, made necessary by the interruption of burlap imports, was the conversion of looms producing peacetime fabrics to the production of bag fabrics. The tremendous demand for sandbags, camouflage cloth, food, agricultural and other bagging, caused a conversion order to be issued for the purpose of raising the annual production rate of osnaburg from 263,500,000 yards to 660,000,000 yards, and bag sheeting from a rate of 488,000,000 yards to 855,000,000 yards. The result of this order, and of the military schedules already in effect, was to put the cotton weaving industry about 88% into war, essential industrial, and essential civilian production.

Plant conversion went on with feverish speed. Carpet looms were swung to blankets and duck; the lace industry turned to mosquito netting and insect netting of which it produced millions of yards. The flat-knitting industry with its tricot machines also is engaged in the manufacture of mosquito netting. The sewing thread industry was converted to the production of combed yarns. What once was the silk industry is now doing a tremendous amount of war work. Those mills which had equipped themselves for throwing Nylon yarns for hosiery are now throwing the Nylon for parachutes. That section of the silk industry that was equipped for weaving rayon fabrics is producing fabrics of high-tenacity rayon for flare chutes, cargo chutes and delivery chutes. Many silk and rayon looms that formerly wove clothing materials are now weaving parachute fabrics.

Today practically all Nylon is used for military purposes and the bulk of high-tenacity rayon goes into military fabrics.

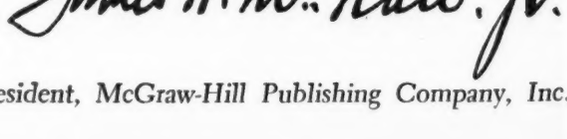
Above and beyond all the new developments is the gigantic job of producing millions of yards of standard fabrics of many colors and weaves. To produce all the uniform fabrics and blankets is in itself quite a job. The woolen and worsted industry has been doing it magnificently. Tent fabrics and summer fabrics produced by the cotton industry are no less a formidable assignment. I could point to myriad other jobs no less impressive.

The production man can indeed take pride in this record and behind the production man, the textile technician has been working tirelessly. Mildewproofing and waterproofing, so vital in a world at war, are in a new stage of effectiveness. A new process for waterproofing fabrics employs vinyl acetal plastic in place of precious rubber. Textiles that glow in the dark have been perfected for black-outs and other applications. American genius is solving problems many of which seemed insurmountable. Silk, for example, was something the Japanese thought we could never duplicate. A new synthetic textile filament that weighs but one eighth of the finest silk filament threatens to put the Japanese silkworm out of business after the war so far as we are concerned. The post-war possibilities of this development challenge the imagination.

Nor has the primary textile industry been alone in its contribution to the war. The textile machinery industry has been converted almost entirely to war work, save for a few facilities required to relieve extreme bottlenecks and supply essential maintenance and repair-parts.

Similarly, some textile mills, particularly hosiery mills hard hit by the silk and Nylon cut-off, are utilizing their space and skilled staffs to produce parts for war equipment.

The immediate significance of all this is its importance in the winning of the war. There is, however, a post-war implication which is important to the future of America. A mass production textile industry will serve civilians after the war more effectively than ever before, and will put new standards within the reach of millions. A long step has been taken toward that completely synthetic textile industry which some observers see in the future. The tempo of such changes has been accelerated tremendously. The oldest industry in the world, now one of America's largest, is showing a youth and vigor that promise much for the future... nationally and internationally.



President, McGraw-Hill Publishing Company, Inc.

FOOD INDUSTRIES

FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

LAURENCE V. BURTON, Editor — MARCH, 1943

The Talk of the Industry

• A VERY smart big shot, well known in financial and industrial circles, recently imparted this bit of information while under the warming influence of two Manhattans. Without attempting to pass on his contention we share it with you:

"Twenty percent of the national income is the top limit for the cost of government. If the percentage goes higher, then prices will increase until the government's share goes down to 20 percent. There is no way to hold down inflation if the cost of government goes above the 20 percent figure—absolutely none!"

• FROM the way some of the Treasury officials use the word "forgive," you'd think that anyone who had incurred a Federal income tax liability, by virtue of supporting himself in 1942, had committed a crime.

• MR. RANDOLPH PAUL, councilor for the U. S. Treasury at hearings on the pay-as-you-go tax plan, exhibits that proprietary attitude toward his job that characterizes so many persons in our Capital. He should be informed that the Treasury belongs to all of us.

• FROM Mr. Paul's opposition to changing the basis for assessing personal income taxes from 1942 to 1943 it is at once apparent that he believes we held our breath for an hour when all clocks were moved ahead from standard time to war time.

Common sense—thou are a rarity!

• ONE may derive a wan smile from memories of the National Nutrition Conference for Defense, of May, 1941. During the preliminary meetings on agenda this department was called in for advice that was promptly disregarded. Section 7 was originally set up to discuss the effect of processing and distribution on nutrition. The general organizing committee could not see anything but vitamins in the future nutrition problems of the nation. Consideration of good old-fashioned calories was urged for it was obvious, even then, that adequacy of food supply was going to be far more important than advanced principles of scientific nutrition.

In retrospect it is clear that the conference would have done far better to have jolted the nation on the impending food shortages than to resolve on the social aspects of nutrition.

• MEMBERS of Congress are beginning to suspect that the U. S. commitments on food are too large. Any informed person who tries to set up a balance sheet on what we can produce and process compared to what we are expected to distribute abroad under Lend-Lease is due for a terrible shock.

We have bitten off far more than we can chew, and it is high time we realized it. Even under the most favorable agricultural conditions we cannot make good abroad and eat as usual at home.

In the food sense we are insolvent. Our liabilities far exceed our supplies plus capacity to create more.

Unhappily there is nothing less than tragedy in the situation. Britain and Russia must be kept adequately fed even if the U. S. must go on extremely short rations. Beating the submarines or the collapse of Germany and a favorable crop year are the only outs in 1943.

• IN due time, it appears, 10 out of every 14 able bodied men from 18 to 38 will be in the armed forces. And, one suspects, the remaining four will be ordered into essential industries, preferably war industries.

While the majority of food plants will be rated as essential industries there are undoubtedly many of which will find themselves in awkward circumstances.

There is only one way to meet this situation—that is to train women to do the jobs. Food plants cannot pay the high wages of munitions factories, but there are many compensating features for work in a well-kept, well-managed food processing plant. Working with food is far more familiar to most women than

bucking rivets or welding. The work is cleaner, and the surroundings are generally more pleasant.

But it is up to the ingenuity of management to provide the glamour, the sense of worthy accomplishment in helping to win the war. Management will be on trial. Those who are skilled in public relations work will find the going less difficult.

Our Terrific Gamble

In order that all may know what we are doing, let it be recorded here that the United States is making one huge gamble on the food supply of our own people and those who depend on us for food during the war. The gamble is that the United Nations shall knock out Germany by the end of the year or, failing that, shall conquer the enemy submarine so that we can draw upon South American food reserves for 1944.

Within this major gamble is the minor gamble, well known to all food processors and farmers—the eternal gamble that we shall have one more good crop year in 1943. (We have had a succession of three good crop years.)

If the gamble on military strategy fails, your guess is as good as the next one on how much food we shall have available and who is to get it. Common sense dictates that our fighting allies must be kept from hunger, even if civilians in the United States go on extremely short rations. The gamble is victory over the Nazis this year or an extreme reducing diet next year and a greatly prolonged war.

It is not within our capacity to debate the wisdom of the military calculations. Like moving a freight car with a crow bar, there comes a time to drop the tool and push ahead by hand. In military strategy there also comes a time to keep going ahead when the enemy is groggy and messed up—never to let him get an instant's respite, nor a good night's sleep, nor a chance to stop and dig in, nor the opportunity to regroup his forces. From such superhuman effort comes victory by strategy in contrast to victory by a long and costly and bloody war of attrition.

While most of us are incompetent to criticize the military strategy, FOOD INDUSTRIES believes that we should all know the magnitude of the food supply factor in the gamble. It is nothing short of terrific.

Food Rationing Dilemma

Rationing of foods creates a dilemma from which there is no easy exit. The idealists want to treat everybody alike and allot to each person his *pro ratum* of whatever amount of a food which may be available. The realists, however, know that people have very decided preferences for certain foods and would like to see a plan that would not foist upon the unwilling an allotment which would not be normally used.

The plan of equal amounts to every person is probably easier to administer from the Washington viewpoint, but it creates certain absurd and abnormal distributions. These lead to barter of the unwanted food. And the next step would seem to be the black market. Thus one family of tea drinkers abhors coffee and swaps it for the tea of a family of coffee drinkers. In this case both families are happy, but what is to prevent some enterprising persons from setting up "exchanges" that soon may lead to something less innocent?

Canned food rationing offers a different problem for there are many housewives who prefer unprocessed foods and may even pride themselves on never buying the canned varieties.

Yet, irrespective of their prejudices, they will share alike with their neighbors who are avid users of canned foods. Your canned food family will normally use a quantity far in excess of the allotment.

How to attain a sensible and equitable distribution is not easy. Little is gained by forcing unwanted canned foods on the unwilling. Something

Hors d'Oeuvres

• Looks like someone better develop a machine for slicing "globaloney."

• *We have been told that we must stop living off our fat and get down to bone and muscle. That would be using our head.*

• More than 10,000 men who worked for Swift & Co. are now with the armed forces. They're off to show the Germans a few tricks about killing pigs.

• *As a guide to the draft status of farmers, a draft board down South received this definition: "Eight milk cows equal 72 hogs, 4,000 broilers, 120 ewes, or one farmer." How evolution has progressed.*

• Restaurant owners say that further restriction may force them to serve coffee as demitasses instead of full cups. The doughnut boys better get busy on a smaller model.

• *A goal of 18 million Victory Gardens has been set for 1943. Whom do we see about a priority for bean poles?*

• Quickly soluble coffee-sugar tablets have been developed experimentally for the Army. They ought to add dried skim milk. Boys from the cities would never know it wasn't cream.

• *The Quartermaster Corps is using discarded liquor barrels as kennels for Army dogs. Hooch hutches for pooches.*

• The 1943 Victory Book Campaign is collecting books for service men. When you select a book to turn in at your local library, remember—tired soldiers sleep well at night, so they don't need books that put them to sleep.

• *The Pacific washed the paper labels off canned food shipped to an Army outpost. A task force cook depended upon his intuition in "selecting" a varied diet for a five-day operation. For five days the soldiers ate canned corn. Now they know why Wickard wants canners to put permanent labels on tins.*

• We have food rationing and we have a gasoline shortage that forces us to walk and work up the best appetite we've had in years. Perhaps its poetic justice.

• *Chicle workers are to collect rubber in Central America. If they get their shipments mixed up some people are going to get a lot of mileage out of their chewing gum.*

• A sign in a Norfolk grocery reads: "For complete food rationing information follow the arrow." The arrow leads to another sign at the back door which says: "Walk east four blocks. Washington boat leaves at 5:30 p. m." A bum steer in more ways than one.

• *The Navy's abandon ship ration is 1 lb. of hard bread and ¾ lb. of canned meat. Not exactly the food one would choose for a vacation cruise.*

• They say Kouzou Kzartma "tastes like something you dreamed about while on a diet." Could be a blonde. F.K.L.

like a can-for-can exchange, like the tube-for-a-tube plan of getting toilet goods in collapsible tin tubes would appear to be the basis of an equitable scheme. But it lacks any method of control of the total amount that might be purchased.

Butter and sugar offer fewer difficulties of the foregoing sort. They appear to be two food items that come very close to universal appeal.

America, the erstwhile land of plenty, has never faced problems like these before.

Do It the Chinese Way!

A new phrase "Do it the Chinese way!" has appeared in some food companies. We first heard it in the Atlantic Coast Fisheries Co. It's worth adopting in any company after you understand what it means. For it is the appropriate answer to "It can't be done" when you can't buy tools, instruments, gadgets, metals or equipment without waiting for interminable months.

"Do it the Chinese way" means to do as the Chinese have learned to do, with only the most primitive equipment and scant resources. They often accomplish what would be impossible to most of us unless we too had the intense burning desire to accomplish and the patience to stick to the job.

From a log the Chinese fashion an oil press with the aid of a few primitive carpenters tools. The Chinese developed the centrifuge from little but fibers. With no more than bamboo, fibers and a few pieces of metal the Chinese drill salt wells over 1,000 ft. deep, all hand operated. Most of China's salt comes from wells that required from 80 to 100 years of patient drilling. Great grandfather began the well, spent every spare minute of his entire life drilling the hard rock. His son's family kept it up as long as they lived. Then grandson's family put in all of their lives. Finally great grandson, now in middle or late age, reached salt, and potential wealth. But water has to be carried two miles uphill and poured down the well every day. Next morning a primitive bucket of bamboo is lowered a thousand feet to bring up a couple of gallons of brine which is then evaporated in an equally primitive manner. Tedious, amazing, but they get the salt! They are now wealthy because they got what they needed.

The Burma road was built mainly by hand labor without the aid of power shovels, bulldozers and tractors.

The Chinese way is one way to get what you need, even when you can't get a priority rating high enough to buy what you need. To be sure it's costly in man-hours. But, if your company goes out of business, that's even more costly.

Food processing problems in this war will be more acute as time goes on. It's up to every one in the food processing industry to carry out his task, even if it is necessary to do it the Chinese way.

Let no man say: It can't be done. It's got to be done!

If you want to do it so intensely that you lie awake nights trying to figure how, you will evolve a scheme.

It can be done if you really want to do it.

Notice—Paper Rationing Affects Subscribers

To offset the paper shortage, all publishers of periodicals, newspapers as well as magazines, have been cut 10 percent by order of WPB. Well-informed persons fear that the cut may not be large enough to equalize demand with the limited supply. Another reduction may be necessary at some future date.

How does this affect you? At first you will notice that our page size has been reduced, making the magazine smaller. Next, that your copies will stop coming the moment you permit your subscription to expire. Later on there may be more drastic measures.

England has supplied so many examples of what we have eventually had to face in the United States that we quote the following notice which has appeared for many months on the Contents Page of our British contemporary, *Food*.

"Notice to Subscribers"

"Consequent on further paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list which will be dealt with in rotation in replacement of existing subscribers who do not renew their subscriptions."

Thus, in Great Britain, if a food manufacturer permits his subscription to lapse he is cut off until some one else defaults. Paper rationing has not yet forced such drastic measures here, but it is likely that United States publishers will be forced to take similar action.

At the outset of paper rationing the most serious matter for you is that neglect to renew your subscription will mean that any missing copies cannot be provided. We have to make every pound of our paper supply go as far as we can.

Don't allow your subscription to lapse. We are not printing extra copies to fill future orders.

New Factor in Meat Supply

To explain the mysterious decline of meat supply available to civilians there are several factors to be included: (1) Numbers of live animals on farms; (2) ratio of cost of feed to price obtainable for animals; (3) adverse weather that may prevent shipping animals to market; (4) buying power of the population; (5) Army-Navy demands; (6) Lend-Lease demands; (7) a newly recognized factor; (8) black markets.

Newest factor is the locker plant, which is a freezer-storage safety deposit box holding about 150 lb. per locker and renting to patrons at about $10 to $15 per year. Locker plants are not a novelty, there being about 4,000 of them, averaging 300 lockers per plant, each holding 150 lb. Current conjecture is that rural patrons of locker plants are loading their lockers with meat instead of the customary miscellany, on the theory that God helps them who help themselves. Since these operations are strictly private and legal they do not come under OPA regulations or rationing, nor is there any way of knowing exactly what the locker patrons are doing.

Let's see how big this unknown factor might be: $4{,}000 \times 300 \times 150 = 180{,}000{,}000$ lb., or about 6 lb. per family in the United States. If there are actually 4,000 locker plants with 300 lockers it would mean that about 1,200,000 families have their own freezer storage plants, and if these all decided to buy a critter for slaughter or to kill their own and put away 150 lb. you can see it could make an appreciable though temporary dent in the meat supply. The

best guess is that hogs have been going into the lockers and that they were all filled to capacity by mid-February, after which, it has been anticipated, hogs will go to public slaughter. If the theory is correct it could account for about 1¼ million hogs.

Harry Carlton, University of Tennessee marketing specialist, has called attention to the locker plant as a potent factor in food preservation. Present meat scarcity may, perhaps, be due to this neglected factor. But Lend-Lease people appear to be the most concerned and are considering ways of prying this meat loose for export.

Help From Mexico

Every little while some one pops up with the proposal to import Mexicans to work on United States farms and in food processing plants, thereby helping to relieve the labor shortage. It has been tried, with rather surprising results. But, with a deep understanding of the new problems, the aid of our neighbors to the south can be successfully utilized.

Most difficult problem of all is that the Mexican who comes from the land is a simple, frugal soul with little spirit for the accumulation of wealth. His pay on this side of the Rio Grande is so much more than he is accustomed to that he generally takes a holiday until he has spent it. Then he resumes work.

Twenty-five years ago when negro labor followed this plan of a week's holiday after a payday, certain foxy manufacturers employed crap shooters to keep the boys broke. But, as far as we can observe, the Mexicans seldom gamble. The only successful plan seems to be to employ a double crew and persuade them to stagger their "vacations." Railroads in the Southwest have found that it works.

A different problem, one with which we have had personal experience, is a strange hostility that seems to exist between Mexicans who have become citizens of the United States and those who are merely here to work and return home. Though they look alike, they hold deep and abiding prejudices against each other. One holds the other to be a traitor to the land of his fathers; the other regards the one as an unenlightened back number. And occasionally knives are used to settle the arguments. The only way out is to keep them in separate groups while they are working, which is a personnel problem requiring long experience and political acumen.

Native Mexicans are good workers under the direction of those who understand them and refrain from requiring U. S. customs and manners of them.

The Nutrition Foundation

Occasional misunderstandings regarding the purposes of the newly created Nutrition Foundation, Inc., suggest the need of further explanation of its function.

First of all, it is not a scheme for promoting this or that particular food. As a matter of fact direct commercial results are not sought from its set-up.

The Foundation was organized by a group of public-minded food and related manufacturers to finance research and education in nutrition by giving grants of money to meritorius applicants.

A Scientific Advisory Committee composed of some of the outstanding names in nutritional science passes on the applications for money grants. If the plan of the investigation is not sound, not calculated to reveal the desired knowledge, the request is turned down. If, however, it satisfies a critical appraisal, it is forwarded to the trustees of the Foundation for recommended action. This committee also assists the director in developing new research areas and in the integration of nation-wide research programs.

The trustees, who are executive representatives (usually presidents or vice-presidents) of the member corporations, decide how many of the recommended applications can be financed with the funds available. In no case do the trustees pass on the merits of the proposed investigation. That job is left to the wholly independent Scientific Advisory Committee. And in no case are there grants for applied research. That job is wholly up to the research staffs of the various member corporations.

A Food Industries Advisory Committee composed largely of technical men from member corporations serves as a liaison group between the Foundation and the member firms. It also serves as a consultant group to the Scientific Advisory Committee, but it has no voice in deciding on projects that are to be granted aid.

Grants of money during 1942 totaled approximately $160,000, divided as follows: One-third to researches dealing with the war emergency; one-third to researches dealing with public health aspects of nutrition; and one-third to purely exploratory researches where the knowledge sought is considered to be an end in itself. The latter is often called pure science, and the application value of the results to be gained are unpredictable.

In brief, through the Nutrition Foundation, the leaders in the food industry hope to see the food supply of America make its maximum contribution to the public's health. To accomplish this purpose, they see a need for more factual information (to be obtained by research), better trained personnel and more widespread education.

An altruistic endeavor of this sort merits the support of a large number of food and related manufacturers. Founder members pledge themselves to pay $10,000 per year for five years. Sustaining members pledge smaller sums, roughly in proportion to their capitalization.

Producer-Gas Vehicles

We had hoped to be able to describe the design and operation of small gas producers for commercial vehicles as used in certain other countries where gas is as scarce as on the eastern seaboard. It is however, a military secret, so we are informed by two embassies and the State Department.

Anything to beat the Axis!

The Shape Of Things To Come

A "Help Wanted" ad from a large daily paper gives a clue to the training expected of factory superintendents in the future. This one reads, "Superintendent for chocolate factory. Experienced preferred. Must be graduate in agricultural or biochemistry (with preferred minors in bacteriology and dairy husbandry . . .)."

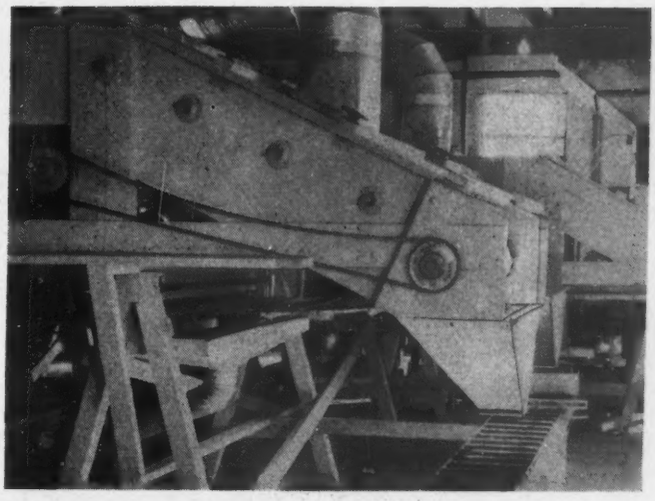
How Potato Shreds Are Made

Idaho dehydrator pioneers product which has reached annual volume of 6,000,000 lb. Develops own methods and machines

FIVE years ago, the food products division of Rogers Bros. Seed Co., Idaho Falls, Idaho, took over what appeared to be an interesting new food product. They bought the patents and some homemade machinery, and with no prior art to guide them set to work to perfect and simplify a process. Little did they dream that in five short years their annual volume would reach 6,000,000 lb.; that they were pioneers in this form of vegetable dehydration; and that these Idaho potato shreds would be one of the products much sought after today by the Army and Navy. Indeed, so insistent has been the demand from the armed forces for shreds that the company voluntarily has shut off all deliveries to its regular trade and is operating its two plants 24 hours a day, seven days a week, to fill its war contracts. And all this at a time most ideal to promote the sale of this excellent product to the established restaurant and industrial-cafeteria business.

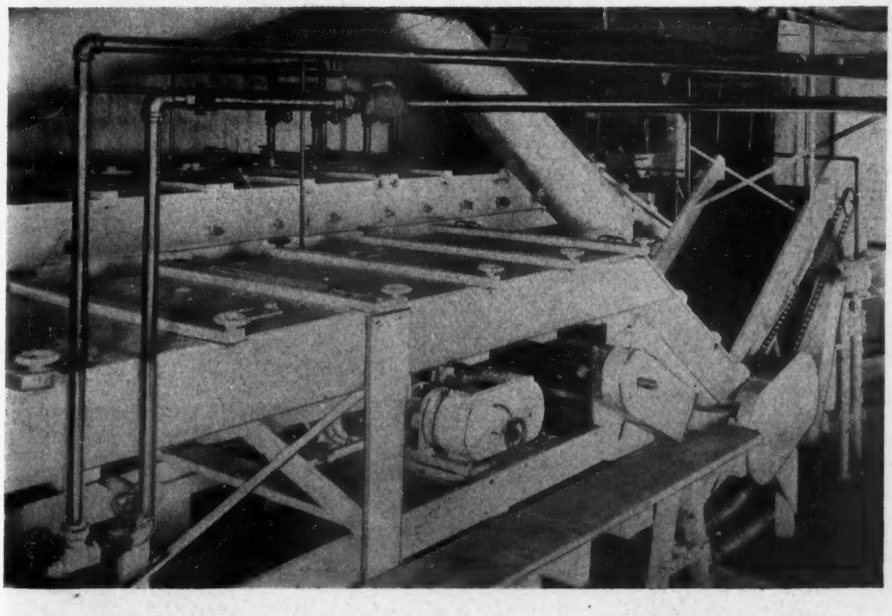
What are Idaho potato shreds? Just sound Idaho potatoes that are washed, peeled, cooked, riced and dried. They look something like shredded coconut. All the cook need do is to soak the shreds in boiling hot water (equal volumes of shreds and water) for 5 minutes, then whip in the usual way, with the customary ingredients, into delicious mashed potato. One pound of shreds will make 5½ lb. of mashed potato, or about 25 servings. It takes 10 to 12 lb. of Idaho potatoes to make 1 lb. of shreds.

The men responsible for this development are K. D. Rose, president; E. M. Rose, vice-president; E. R. Holden, production manager; and Robert H. Thompson, sales manager. Two plants are now in operation, one in Burley, one in Idaho Falls. Adjacent to the Idaho Falls shred plant stands another dehydration plant owned and operated by Rogers Bros. Seed Co. for the past 17 years. This plant makes Idaho potato flour, which has been used by bakers for many years. The sales volume of Rogers potato flour has reached 5,500,000 lb. a year.



Discharge end of a continuous cooker showing how live steam is entrapped to cook the potatoes on a slowly moving conveyor.

Each piece of special equipment to produce shreds is the creation of "E. M." or "K. D." or "Ed"; each piece of equipment has been developed to a stage of efficiency and simplicity that completely veils the previous headaches, problems and discarded machinery, to say nothing of the thousands of dollars spent, preceding the "know how." Indeed, the very simplicity of everything is the reason the doors are closed to visitors. FOOD INDUSTRIES, however, has been admitted to both the shred and potato flour plants and permitted to describe the general procedure of producing shreds without divulging "military" or shred secrets.



Scalders and cookers must be sealed tight to retain live steam where the "hump-back" principle is employed. Variable-speed drive mechanisms are essential to all continuous operations.

The Process

From the accompanying schematic flow diagram it is possible to learn the general procedure followed without disclosing details that are withheld. The washer appears much like the rotary tomato washer found in many canneries, but differs materially in its design. It is a nonperforated hollow cylinder, 2x10 ft., lined with longitudinal ribs of rubber belting, 1 in. wide, set on edge. These strips are kept about ½ in. apart by rubber spacers. This soft material eliminates gashing and bruising of the potatoes. A center spray pipe supplies water, but the ribs also carry the water up and let it spill on the load of tumbling potatoes, thereby gaining considerable reuse of the water.

Washed potatoes pass over a screen surmounted by another spray to remove

dirt and wash water, then fall into the boot of a steel-bucket elevator which carries them up to the feed hopper of the steam scalder or blancher. More properly, this is a scalding operation to facilitate peeling—for the same sort of purpose that tomatoes are scalded. The scalder, of Rogers' own design, dumps the scalded potatoes into a pair of abrasive vegetable peelers of the batch type, from which they are conveyed by a helical spiral conveyor to cold-water storage.

Inspection and trimming come next on a belt conveyor-table of the customary design which requires each potato to be handled before it can go to the next operation. Operating on a 24-hour day, the trimming department employs a total of 140 women. Then follows another water storage tank from which the peeled spuds are moved by another spiral conveyor to the potato cutter, made by Urschel, to be followed by another water spray to remove starch particles. Then the sliced potatoes go to a continuous cooker equipped with variable-speed control to vary the cook according to condition. The product is now cut, boiled potatoes.

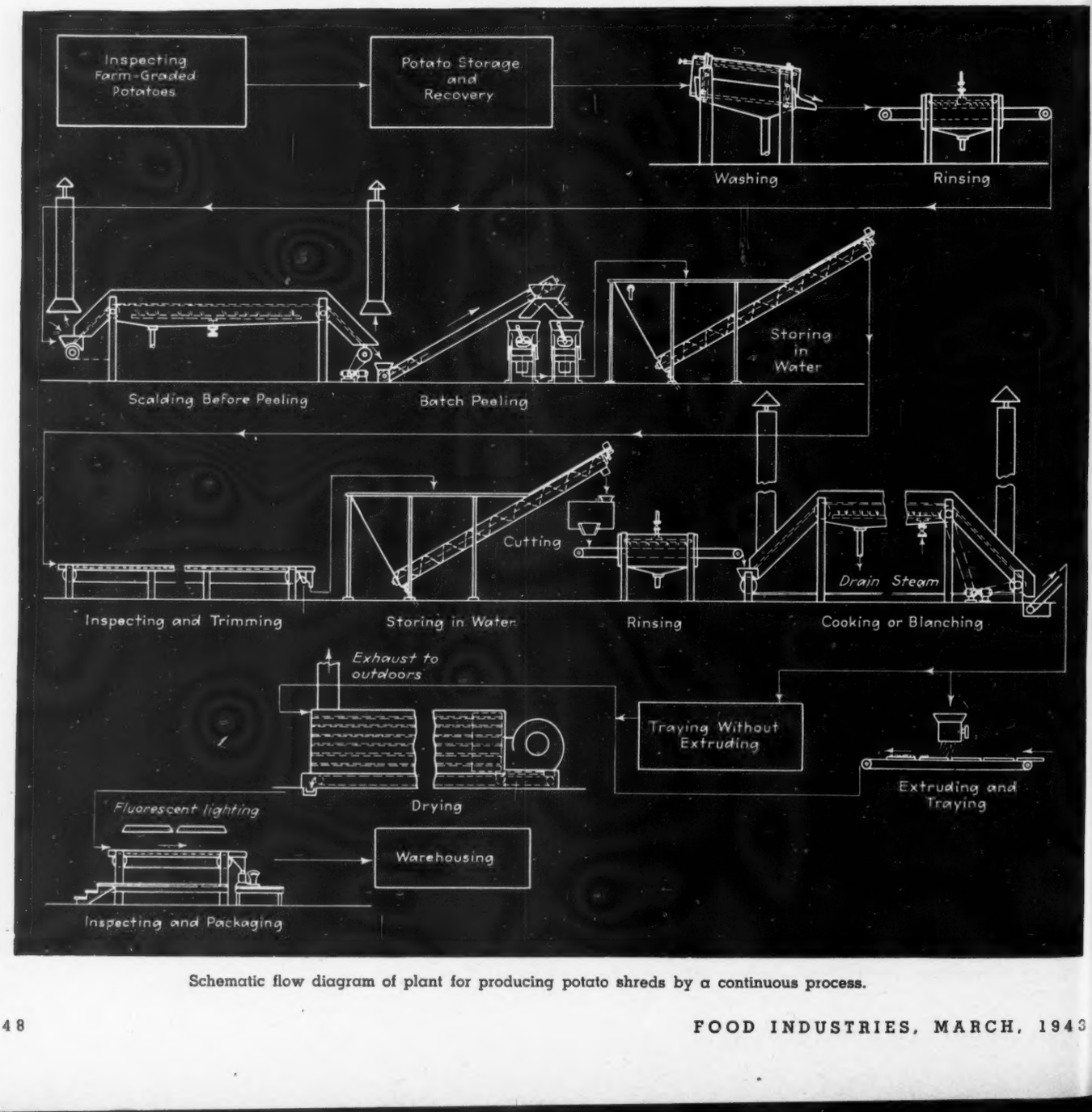
If "cubed" or "diced" potatoes are desired, the product is now spread on trays and dehydrated without further preprocessing.

If, however, shreds are desired, the cooked potatoes are put through the continuous extruder or ricer and then spread on the trays. It is important that complete synchronism of operations be attained, and all equipment from the cutters onward are driven by variable-speed drives.

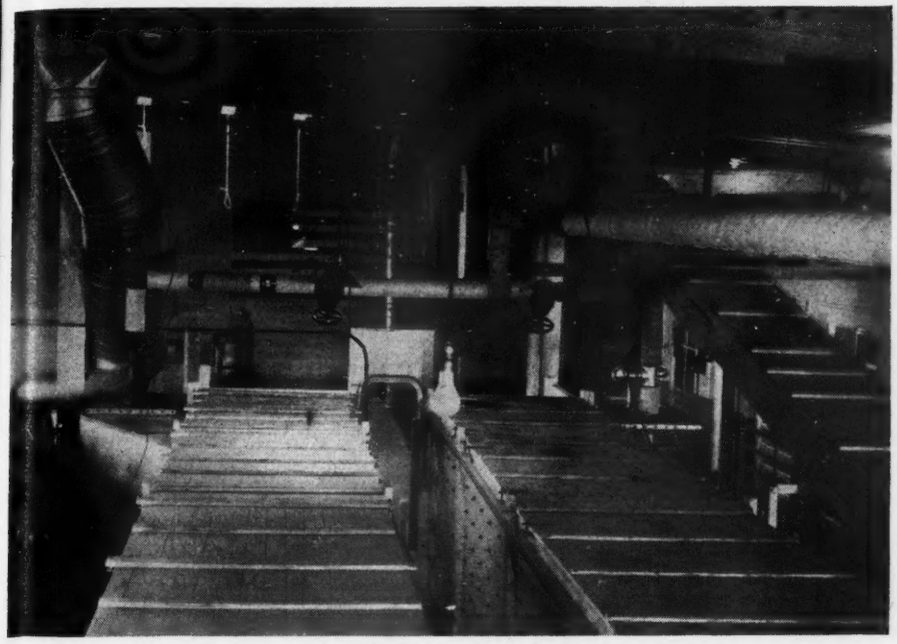
Construction of Dehydrater

The dehydrater itself, one of E. M. Rose's own design, is constructed largely of wood. Each rectangular "tube" (tunnel to you) has a series of six shelves, 2 in. wide and equipped with rollers. On each shelf is a line of trays from one end to the other. When a fresh tray is inserted at the feed end, the line is pushed forward and one is shoved out the discharge end. The drying "tubes" are 45 ft. long. Trays are 30 in. wide by 4 ft. long, with wood frames covered by galvanized steel screen wire such as would be used for making window screens.

Air is heated by steam coils in adjacent boxes and blown through the "tubes" in countercurrent fashion. At each end of the "tubes" are homemade, but very effective, devices to



Schematic flow diagram of plant for producing potato shreds by a continuous process.



Top of a drying tube (tunnel) showing the method of introducing the heated air on the side.

prevent escape of excessive amounts of air when trays are entering or leaving. Red signal lights at each level of trays warn the operator at the feeding end to hold back if his fellow worker at the outside end finds the drying is not quite effective. The latter can thus throw any one of six toggle switches to control the operation of any one of the layers of trays. There is no recirculation of air in this dryer.

As fast as the trays emerge from the dryer, they are dumped onto a canvas belt that runs back to the feed end—the belt is *inside* the dehydrator tube. This gives the final or second-stage drying to the potatoes, either diced or shredded. Rogers' system is really a two-stage dehydration. As a rule, the product comes off the trays in a single sheet or a few large pieces, leaving the trays clean. This is a noticeable difference from the sticking frequently experienced in many plants.

The dehydrated material falls into another spiral conveyor which breaks it up considerably and conveys it to the breaking machine, a device to reduce all lumps and chunks to uniform size.

At this point it passes over short inspection belts under fluorescent lights for final inspection before packaging in 5-gal. tin cans holding 10 lb. net.

Effect of Climate

A comment may be given here for the benefit of those who are not familiar with Idaho conditions. The final inspection of dehydrated material is done there in a room the air of which is not artificially dehydrated, something that is possible because of the prevailing dryness of the Idaho climate. While dehydrated potatoes are not considered hygroscopic, there is always a possibility that in other regions, in a damp, extremely humid climate, the dry product might absorb too much moisture for its own good, and exceed the government's buying specifications.

Cooling of the hot dry material is essential, for packaging of hot stuff is detrimental to quality and is said often to result in mold. The cooling is done at the "breaking" operation, and is accomplished by the dry air of Idaho. Elsewhere it might also require air conditioning to low moisture content—perhaps to 10 percent relative humidity.

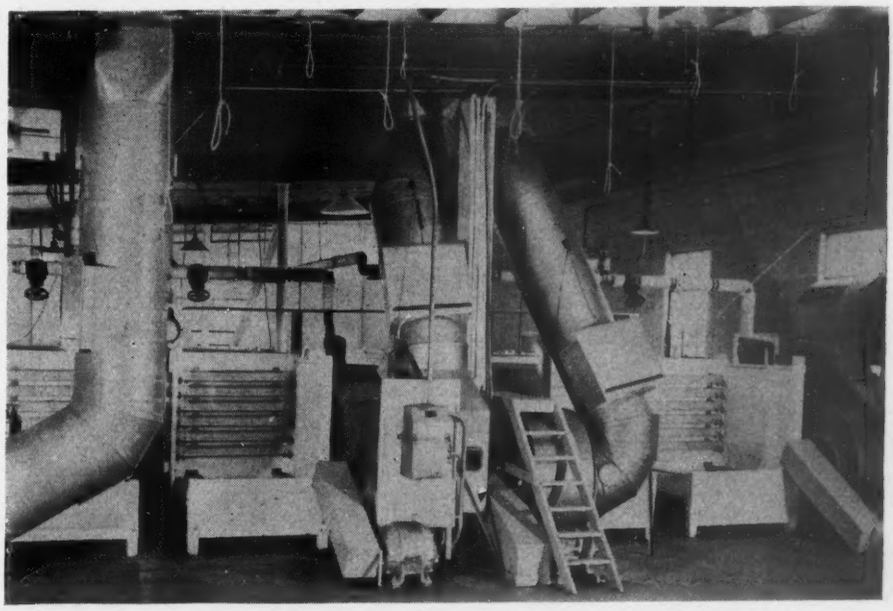
Automatic Control

Control of the temperature of the dehydrater tubes was done manually in previous years but is now accomplished by Taylor automatic controls.

The prior experience reveals the need of ample steam piping. When four drying tubes were fed from a single 3-in. steam main, any variation in valve setting on one tube would be immediately reflected by changes in the drying temperatures in the others. Thus, there ensued a continual and endless series of adjustments for each tube, and it was seldom that any steam-valve setting could remain long in one position. Though automatic control instruments would have improved the situation, it was obvious that larger piping was needed. Accordingly, in 1942 the steam main from the boilers was increased to 5-in. size, with one 3-in. header leading to each pair of dehydrator tubes. From this line a 3-in. line leads to each tube through the automatic temperature-control valves.

Bucket-type steam traps have not been found to be wholly satisfactory and have been replaced by thermostatic traps on heating coils.

EDITOR'S NOTE: *Though there are many gaps in the technical information in this article, it is presented with the explanation that the story was obtained only by agreeing to omit certain important details.*



Discharge of a countercurrent drying tube (tunnel). Emerging trays are dumped onto a canvas belt that carries the shreds back through hot air to bottom of feed end, giving parallel current drying in the second stage.

Peroxidase Test for Blanching Requires Careful Application

By H. J. PHAFF and M. A. JOSLYN
Division of Fruit Products, University of California, Berkeley, Calif.

Proper indicator must be employed under conditions for which correlation between enzyme inactivation and flavor retention were established. And the results should be interpreted with caution.

IT is now generally considered that hay-like off-flavors and the accompanying changes in color and flavor which occur in many unscalded dehydrated vegetables are due to the activity of thermolabile as yet unknown enzyme systems. The nature of the enzyme systems involved may be determined either by empirical correlation of particular enzyme activity and degree of flavor and color retention or by determining the chemical constitution of the product or products responsible for the off-flavors. The former procedure yields results of immediate practical value since it not only defines the systems involved but also forms the basis for control test procedures.

As a result of studies of this type, Cruess and Joslyn[4] have proposed peroxidase activity as a test for the adequacy of the scalding procedure used in preparing most vegetables for dehydration. The peroxidase test may be performed on the freshly blanched vegetable after cooling or on the dehydrated vegetable after soaking in water to refresh the tissues. The test consists in adding a small quantity (1 c.c. or less) of a 1 percent alcoholic solution of a suitable indicator and 1 c.c. of a freshly prepared dilute solution of hydrogen peroxide (0.3 to 0.5 percent) to several grams of tissue covered with about 20 c.c. of water in a 24-mm. test tube. To obtain a more representative sample, larger quantities of vegetable tissue may be taken. For example, in the case of potatoes, 15 to 20 grams may be covered with water and 1 c.c. of guaiacol and 0.7 c.c. of 1 percent hydrogen peroxide added. After adding the reagents, the mixture is well shaken and observed for color changes. Immediate and extensive coloration of the vegetable tissue is evidence of the presence of active peroxidases and hence inadequate scalding. Slower but extensive coloration indicates partial inactivation of peroxidases by scalding. No coloration indicates complete inactivation of peroxidases (see Figs. 1 and 2). The period of observation should not be extended beyond the first half hour, usually the first five minutes, to avoid contradictory results due either to general autoxidation or to leaching out of the colored compound.

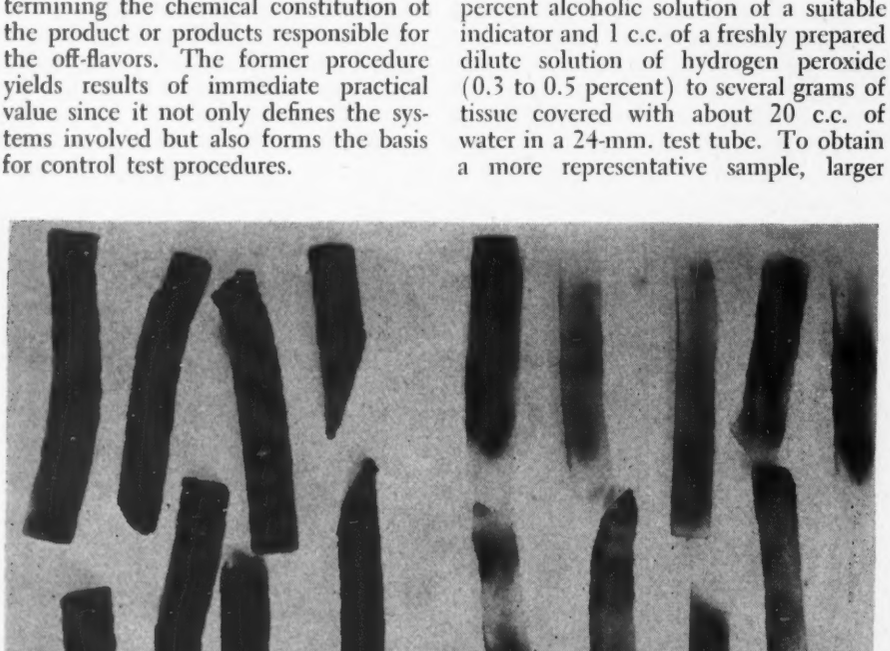


FIG. 1. Potato strips treated with guaiacol and hydrogen peroxide. Totally unblanched strips (left) acquire a dark brownish red color. Underblanched pieces (right) acquire a light red color. Note more intensively colored areas where pieces were partly covered by other strips and access of steam was impaired.

Must Be Done Properly

When sampling scalded vegetables for extent of inactivation of peroxidases it is, of course, desirable to test those portions which are exposed to least heating; for example, central portions of the toughest and largest pieces selected from positions on the tray farthest removed from surfaces exposed to steam.

The success of this test depends on the use of the proper indicator under the experimental conditions for which correlation between enzyme inactivation and flavor retention was established. A large number of indicators have been proposed for testing for peroxidases; Kastle[6] lists some 40 compounds, all of which have the property of being converted into readily observable intensely colored compounds on oxidation by hydrogen peroxide in the presence of peroxidase. These indicators of enzyme activity differ in their specificity, ease of oxidation and other properties. It is well recognized that the relative peroxidase activity towards these indicators varies for different vegetables (Bunzell[2], Joslyn *et al*[5] and others). It is also known that in some plants the relative oxidase (enzymes that can oxidize in the absence of hy-

drogen peroxide) activity as manifested toward various reagents is approximately the same for different parts of the same plant (potato tuber, stem and leaf; sugar beet and its leaves). But with others—spinach, for example—the oxidase activity of the roots and that of the leaves are entirely at variance as regards specificity toward indicators (Bunzell[2]). Similar relationships hold for peroxidase activity also. Different portions of a single vegetable sometimes have different enzyme characteristics; as a rule the peroxidase activity is most intense in those portions of the tissue where respiratory and other metabolic activity are greatest. The cells surrounding the fibrovascular bundles of a number of fruits, including apricots, peaches and nectarines, contain extremely active perixodases and oxidases (Keeble and Armstrong,[7] Mangenot[8] and Samisch.[14] Samisch[14] also found oxidase activity to be greatest in the epidermis and particularly the stomatal guard cells of apricots. In the potato, peroxidase activity is most intense in the sheaths of vascular bundles and in the roots or in the eyes.

Vegetable tissue damaged as a result of suboxidation owing to improper storage conditions or as a result of incipient internal browning, as in potatoes, gives a particularly intense peroxidase reaction in the localized damaged tissue. Internally damaged tissue is not readily detectable on trimming and sorting belts.

Joslyn and his collaborators[6] have shown that not only does the relative activity of the peroxidases of a particular vegetable tissue vary with the indicator but the apparent rate of thermal inactivation of the vegetable peroxidases also varies with the indicator. Consequently, it is necessary to select the proper indicator for the particular vegetable tested. There is no generally applicable indicator suitable as a test for adequacy of scalding all vegetables; in some vegetables—carrots, for example—the catalase test may be preferable to a peroxidase test. As a result of recent tests, Cruess and Joslyn[4] have selected guaiacol as the most useful general reagent, because it is more stable than guaiacum (or gum guaiac) and more specific than benzidine, but even guaiacol is not always foolproof.

One difficulty with peroxidase reagents is the fact that they are all to some degree oxidized by hydrogen peroxide alone or when thermostable metallic catalysts (iron and copper salts chiefly) are present. Benzidine is least reliable in this respect, but guaiacol is not without fault. Although guaiacol (and guaiacum) will not be oxidized rapidly by hydrogen peroxide in the presence of iron and copper ions, certain compounds likely to occur in plant tissues do affect it. Mergentime[9] has shown that peroxidase reaction (towards guaiacum) of baby lima beans is quite strong in the skin but weak in the cotyledon. And Joslyn has observed that rate of inactivation of peroxidases in skins of peas and beans is much slower than that in cotyledons; in some cases overscalded, frozen peas still gave a "peroxidase" reaction, undoubtedly due to the presence of thermostable catalysts. Corn behaves in a similar manner. The peroxidase activity of the meat of the kernel toward gum guaiacum is readily destroyed by scalding, and if the meat of the kernel is free from blue color the blanch is sufficient for prevention of off-flavor during freezing storage. In corn that is properly blanched, however, a blue color will develop with guaiacum on the skin of the kernel, particularly near the base where it was attached to the cob, but this is not indicative of underscalding (Mergentime[10]).

FIG. 2. Potato strips treated with guaiacol and hydrogen peroxide. Left, some selected strips with the characteristic red spots and veins. They were, however, properly blanched, as well as the strips on the right which do not show these markings.

Some Phenomena

In recent tests on dehydrated vegetables we have had occasion to observe that in corn and potatoes there occur heat-stable catalysts (located in certain rather sharply localized definite areas) which oxidize guaiacol in the presence of hydrogen peroxide and form reddened areas that might be construed as evidence of inadequate scalding. Such is not the case. Adequately scalded corn will usually redden at the base of the kernel, as will potatoes around the eyes and vascular bundles. This localized reddening persists even when the foods are steamed for long periods of time, and the final products may have excellent flavor and color retention (see Fig. 2). These phenomena do not always occur; they are found more often in peas and corn, while potatoes usually do not exhibit this activity unless they are physiologically damaged.

It is our belief that the heat-stable systems involved in the oxidation of guaiacol by hydrogen peroxide are similar in nature to those responsible for the darkening of cooked potatoes. The physiological condition of potatoes (as influenced by growing conditions, maturity, variety and storage conditions) is known to vary, and only under certain conditions is this darkening of potatoes after cooking observed (see Tottingham *et al.*[15, 16, 13, 3] Nutting and Pfund[11] and Robison.[12] Robison has suggested that in raw potato tubers the precursor of the black pigment exists in the form of ferrous iron bound in a loose complex which hydrolyzes on boiling, precipitating the iron as a ferrous compound which is then oxidized. Tottingham *et al*, on the other hand, find a close correlation between the tyrosinase activity in raw tubers and the extent of darkening after cooking. Whatever is the true explanation (we believe that primary products of "phenol" oxidation by ty-

rosinase are involved in subsequent nonenzymic oxidation), it is very likely that either the active iron compounds or the primary products of phenol oxidation catalyze the guaiacol reaction.

In conclusion then, the indiscriminate application of peroxidase reagents in testing for adequacy of scalding is unwise and the results of such tests should be interpreted with caution and in the light of our present knowledge of the systems involved.

References

1. J. G. Boswell and G. C. Whiting, Oxidase Systems in the Tissues of Higher Plants, *New Phytologist*, vol. 39, 241–265, 1940.
2. H. H. Bunzell, The Relative Oxidase Activity of Different Organs of the Same Plant, *Journal of Biological Chemistry*, vol. 24, 103–110, 1916.
3. C. O. Clagett and W. E. Tottingham, The Reducing Substance and Phenolic Compound Content of the Potato Tuber in Relation to Discoloration After Cooking, *Journal of Agricultural Research*, vol. 62, 349–359, 1941.
4. W. V. Cruess and M. A. Joslyn, Relation of Enzyme Activity to Keeping Quality of Dehydrated Vegetables, paper presented at Third Annual Conference of Institute of Food Technologists in Minnesota in June, 1942.
5. M. A. Joslyn, *et al*, Enzyme Activity in Frozen Vegetables, *Science*, vol. 78, 174–175, 1933; *Industrial and Engineering Chemistry*, vol. 28, 595–598, 1936; vol. 30, 1068–1073, 1938; vol. 31, 751–758, 1939; vol. 32, 702–706, 1940. See also *Western Canner and Packer*, vol. 30, No. 5, 21–22; vol. 30, No. 7, 35–37; vol. 30, No. 8, 35–37, 1938; and *Food Industries*, vol. 10, 379–381, 435–436, 469, 1938.
6. J. H. Kastle, The Oxidases and Other Oxygen-catalysts Concerned in Biological Oxidation, U. S. Hygienic Laboratory *Bulletin*, 59, 1–164, 1910.
7. F. Keeble and E. F. Armstrong, The Distribution of Oxidases in Plants and Their Role in Formation of Pigments, *Proceedings* of the Royal Society (London) B, vol. 85, 214–218, 1912.
8. G. Mangenot, Sur la localization cytologique des peroxydases, *Comptes rendus*, vol. 186, 710–712, 1928.
9. M. Mergentime, Control Methods for Scalding Vegetables for Freezing, *Quick Frozen Foods*, vol. 1, No. 8, 14–15, 1939.
10. M. Mergentime, Laboratory Control for Scalding Corn for Freezing, *Quick Frozen Foods*, vol. 1, No. 11, 12, 1931.
11. H. W. Nutting and M. C. Pfund, Nature of Darkening of Cooked Potatoes, *Food Research*, vol. 7, 48–55, 1942.
12. U. M. Robison, Blackening of Potato Tubers on Boiling, *Nature*, vol. 147, 777–778, 1941. See also G. A. Cowie, *Nature*, vol. 148, 285–286, 1941.
13. A. F. Ross, and W. E. Tottingham, Proteolytic Activity in Relation to Blackening of Potatoes after Cooking, *Journal of Agricultural Research*, vol. 57, 434–441, 1938.
14. R. Samisch, The Location of Oxidase in the Apricot, *American Journal of Botany*, vol. 22, 291–293, 1935.
15. W. E. Tottingham, R. Nagy and A. F. Ross, The Problem of Causes of Blackening in Cooked Potatoes, *American Potato Journal*, vol. 13, No. 11, 297–309, 1936.
16. W. E. Tottingham and G. O. Clagett, Polyphenolase Activity as a Primary Cause in Darkening of Boiled Potatoes, *Science*, vol. 94, 497, 1941.

Army Specifications For Dehydrated Foods

Tentative specifications for dehydrated foods for Army use have been issued by the Quartermaster Corps. The Army requirements for various dehydrated products have been published in previous issues, and specifications for other products are given here

KNOWLEDGE of exact Quartermaster Corps specifications for dehydrated foods is necessary information for those dehydrating foods for the Army, as well as for those planning to enter the field. In the tentative specifications below, packaging requirements in each case are given after the product specifications.

Dried Eggs

There are no Federal requirements applicable to this specification. Army specifications applicable to this specification are noted below.

Dried eggs shall be hens' eggs of domestic manufacture and production, and shall be of the following types as may be specified in the invitation for bids. Type I—dried whole eggs; Type II—dried egg whites (albumen); Type III—dried egg yolks; Type IV—dried egg yolks and dried egg whites, blended.

Dried Eggs shall be of the following classes: (*A*) Spray dried; (*B*) pan dried; (*C*) drum dried.

Dried eggs shall be a product meeting all the requirements of this specification and of highest quality for the respective type. They shall be processed and packaged under modern sanitary conditions.

General Requirements

All deliveries shall conform, in every respect, to the provisions of the Federal Food, Drug and Cosmetic Act of June 25, 1938, and to amendments, regulations and subsequent decisions pertaining thereto, all as in effect on date of invitation for bids. The processor shall guarantee the keeping quality of the unopened packages for a period of one year from date of delivery, without refrigeration. The processor shall state on the label that amount of water necessary for addition to 1 lb. of (*a*) dried whole eggs, (*b*) dried egg yolks, (*c*) dried egg whites, and (*d*) dried egg yolks and dried egg whites, blended, so as to reconstitute to the original product.

Detail Requirements

Type I—Dried whole eggs. The dried product shall conform to the standard of identity for this product, and shall meet the following requirements:

Moisture—Not over 8 percent. Bacteria count—Not more than 35,000 per gram. Acidity of ether extract—Not more than 5 ml. of 0.05 normal sodium ethylate. Flavor and odor—This product shall have a sweet wholesome egg odor, both in dried form and when reconstituted. Color—The color shall be uniform throughout. Texture—The texture shall be smooth and free from lumps that do not readily fall apart when under light pressure. Reconstitution—Shall be readily and quickly reconstituted with water, and shall produce a smooth mixture, simulating liquid whole egg consistency. Foreign matter—The product shall be free from any foreign particles, such as pieces of paper, barrel linings, wood splinters, metal particles or other foreign material.

Type II—Dried egg whites (albumen). The dried product shall meet the following requirements:

Moisture—Not over 5 percent. Protein—Not less than 80 percent. Fat—Not more than a trace. Ash—Not over 5 percent. Bacterial count—Not more than 100,000 per gram. Flavor and odor—This product shall have a sweet wholesome egg white odor, both in dried form and when reconstituted. Color—The color shall be uniform and not darker than a very light cream color. Texture—The texture shall be smooth, and free from lumps that do not readily fall apart when under light pressure. Reconstitution—Shall be readily and quickly reconstituted with water and shall produce a smooth mixture, simulating liquid egg whites consistency. Foreign matter—This product shall be free from any foreign particles such as pieces of paper, barrel linings, wood splinters, metal particles or other foreign material.

Type III—Dried egg yolk. The dried product shall conform to the standard of identity and, in addition, shall meet the following requirements:

Moisture—Not over 5 percent. Protein—Not over 33 percent. Fat—Not less than 57 percent. Ash—Not over 5 percent. Bacterial count—Not more than 35,000 per gram. Acidity of ether extract—Not more than 5 ml. 0.05 normal sodium ethylate. Flavor and odor—This product shall have a sweet wholesome egg yolk odor, both in dried form and when reconstituted. Color—The color shall be uniformly golden yellow. Texture—The texture shall be smooth, fluffy and free from lumps that do not readily fall apart when under light pressure.

Reconstitution—Shall be readily and quickly reconstituted with water and shall produce a smooth mixture, simulating liquid yolk consistency. Foreign matter—The product shall be free from any foreign particles, such as pieces of paper, barrel linings, wood splinters, metal particles or other foreign materials.

Type IV—Dried egg yolks and dried egg whites, blended. Shall be a uniform powdered mixture, free from granular particles. The dried egg yolks and dried egg whites shall be so blended as to conform to the following requirements:

Moisture—Not over 8 percent. Protein—not over 47 percent. Fat—Not less than 40 percent. Ash—Not over 5 percent. Bacterial count—Not more than 35,000 per gram. Acidity of ether extract—Not more than 5 ml. of 0.05 normal sodium ethylate. Flavor and odor—This product shall have a sweet, wholesome egg odor, both in dried form and when reconstituted. Color—The color shall be uniform throughout. Texture—The texture shall be smooth, and free from lumps that do not readily fall apart when under light pressure. Reconstitution—Shall be readily and quickly reconstituted, and shall produce a smooth mixture, simulating liquid whole egg consistency. Foreign matter—The product shall be free from any foreign particles such as, pieces of paper, barrel linings, wood splinters, metal particles or other foreign material.

Method of Inspection

Inspection shall be made at point of delivery by the receiving agencies unless otherwise specified. Referring to the detailed requirements given under the above paragraphs, the following methods of examination shall be followed: Bacteriological determinations shall be made by the plate method, in accordance with a modified procedure as outlined in the manual of milk analysis of the American Public Health Association, latest edition. Other laboratory determinations shall be made in accordance with latest edition "A.O.A.C." where applicable.

Packing and Marking for Shipment

Packaging — Unless otherwise specified, commercial packaging is acceptable under this specification.

Packing—Unless otherwise specified, the subject commodity shall be delivered in standard commercial containers, so constructed as to insure acceptance by common or other carriers, for safe transportation at the lowest rate to the point of delivery.

Marking — Unless otherwise specified, shipping containers shall be marked with the name of the material, type and the quantity contained therein, as defined by the contract or order under which the shipment is made, the name of the contractor, the number of the contract or order and the date of packing.

The following department specifications of the issue in effect on date of invitation for bids shall, respectively, form a part of this specification:

Army—United States Army Specification No. 22-42A, "Supplies, Subsistence, for the United States Army, Conditions Governing the Purchase of."

United States Army Specification No. 100-2D, "Standard Specifications for Marking Shipments."

Purchases for the Army shall be confined to Class A (spray dried).

Type I (dried whole eggs), Type III (dried egg yolks) and Type IV (dried egg yolks and dried egg whites, blended) shall be delivered in the following containers as may be specified in the invitation for bids:

Fiber containers coated or lined with a moisture- and greaseproof material that will not affect the flavor or color of the product, fitted with friction covers or plugs or closures affording equal protection to the contents, 5 lb. net weight, packed 6 cans to the case. Hermetically sealed tin containers, inside sanitary enamel, 4 lb. net weight, packed 6 cans to the case. Tin containers, inside sanitary enamel, fitted with friction covers or plugs, 4 lb. net weight, packed 6 cans to the case.

Also—Tin containers, inside sanitary enamel, fitted with friction covers or plugs, 8 lb. net weight, packed 4 cans to the case. Tin containers, inside sanitary enamel, fitted with friction covers or plugs or closures affording equivalent protection to contents, 20 lb. net weight, packed 2 cans to the case. Pressed fiber drums, coated or lined with a greaseproof material, that will not affect the flavor or color of the product, metal tops and bottom, fitted with friction covers, or plugs, or closures affording equivalent protection to the contents, 30 or 60 lb. net weight dried whole eggs or dried egg yolks.

Type II (dried egg whites) shall be delivered in the following containers as may be specified in the invitation for bids: Fiber containers coated or lined with a moisture-proof material that will not affect the flavor or color of the product, with friction covers or plugs, or closures affording equal protection to the contents, 5 lb. net weight, packed 6 cans to the case. Hermetically sealed tin containers, inside sanitary enamel, 3 lb. net weight, packed 6 cans to the case. Tin containers, inside sanitary enamel, fitted with friction cover or plugs, 3 lb. net weight, packed 6 cans to the case.

Also—Tin containers, inside sanitary enamel, fitted with friction cover or plugs, 7 lb. net weight, packed 4 cans to the case. Tin containers, inside sanitary enamel, fitted with friction cover or plugs, or closures affording equivalent protection to contents, 17 lb. net weight, packed 2 cans to the case. Pressed fiber drums, coated or lined with a moistureproof material that will not affect the flavor or color of the product, metal tops and bottoms fitted with friction covers or plugs, or closures affording equivalent protection to the contents, 25 or 55 lb. net weight of dried egg whites.

Cream of Swiss Cheese Soup

The following specifications form a part of the requirements for dehydrated cream of swiss cheese soup:

Federal Specification C-C-301—cheese, Swiss (domestic and process).

Federal Specification C-M-351—milk, dry, powdered; skimmed and whole.

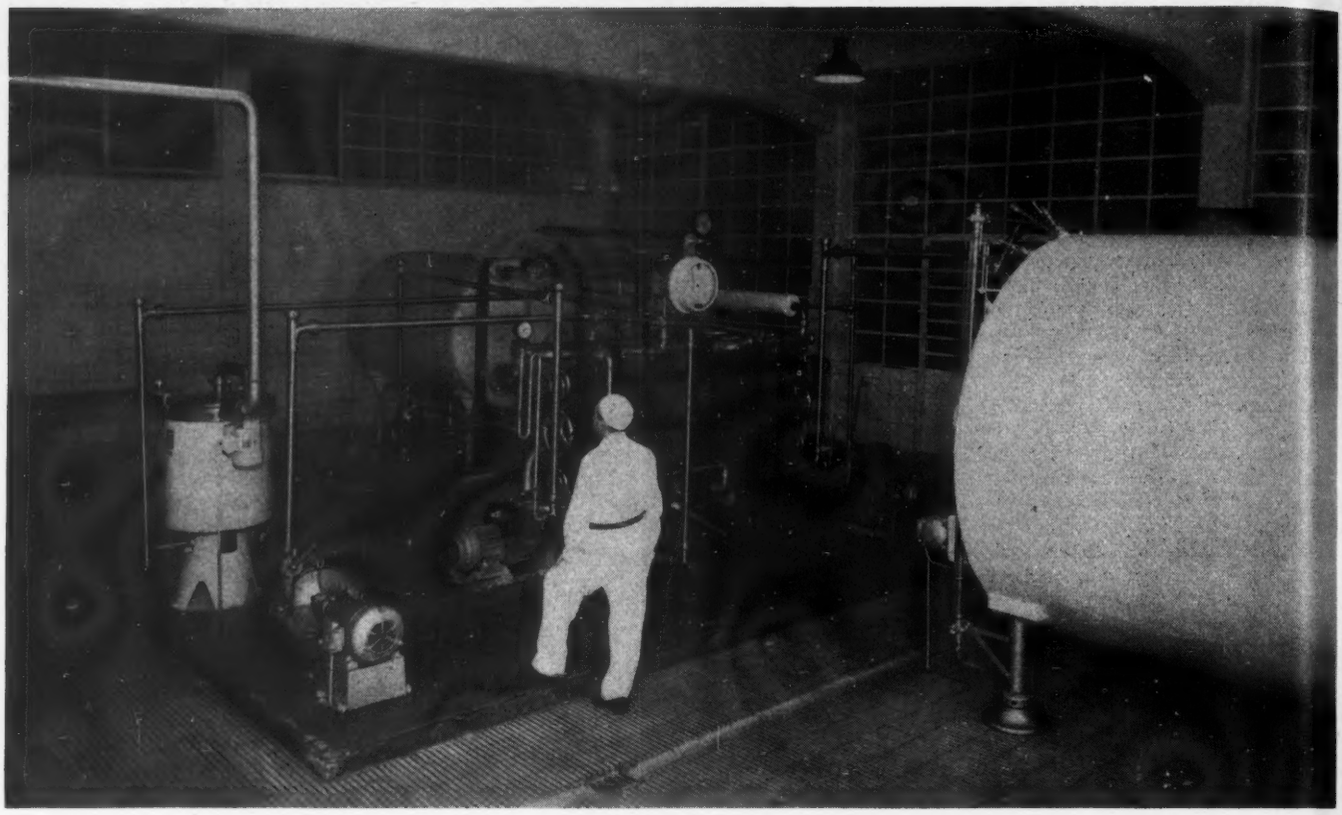
Federal Specifications SS-S-31—salt.

Tentative U. S. Army Specification No.

(*Turn to page 115*)

Three Lions Photo by Boury

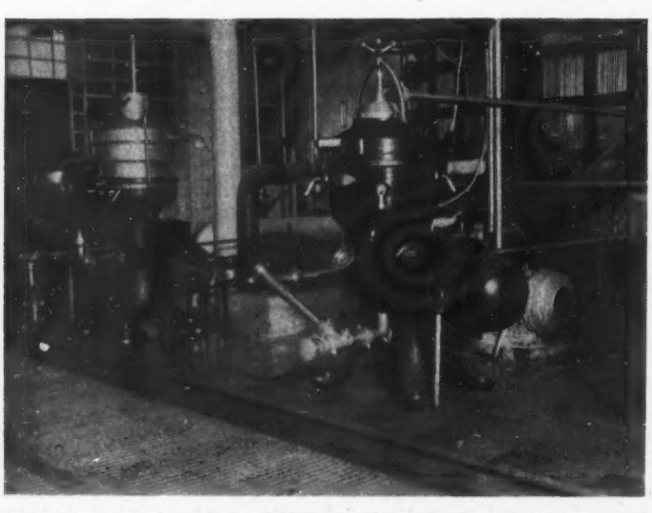
Two cabbages, two bunches of beets, three bunches of carrots and 7 lb. of potatoes and their dehydrated equivalents. The small bulk of the dehydrated products and their light weight are two reasons why the government wants tremendous quantities of these foods this year—much shipping space is saved.



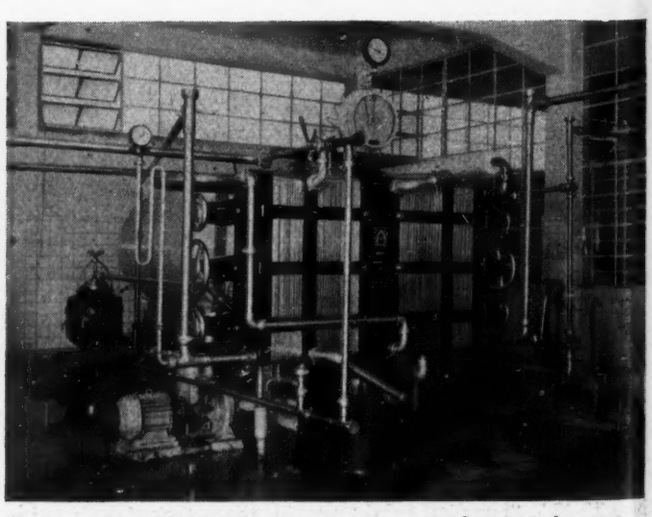
General view of pasteurizing room showing storage tanks, pasteurizer with temperature recorder, sanitary pumps, centrifugal clarifier, nonskid floor and other modern features.

Modern Dairy in South America

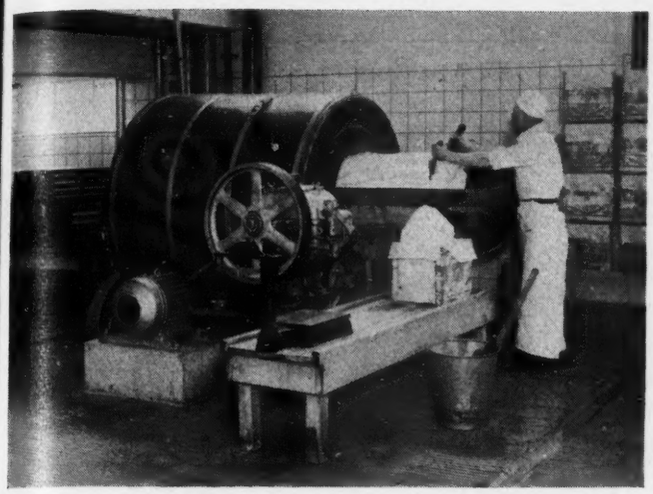
South America is second only to the United States as a potential larder for the democracies both during and after the war. And food production and processing there will have to be coordinated with that in this country if the problem of feeding the world is to be solved. Processing capacity does not approach that of the United States, but there are some well-equipped plants. Witness these pictures of a modern dairy in Buenos Aires, Argentina, that of Cabana Santa Brigida.



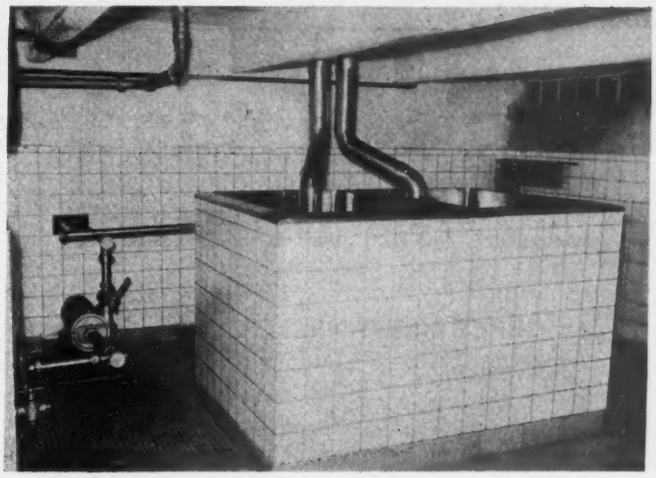
Centrifugal separator and centrifugal clarifier. Note raised floor of smooth, easily cleaned construction but with nonskid tile to provide sure footing at edge.



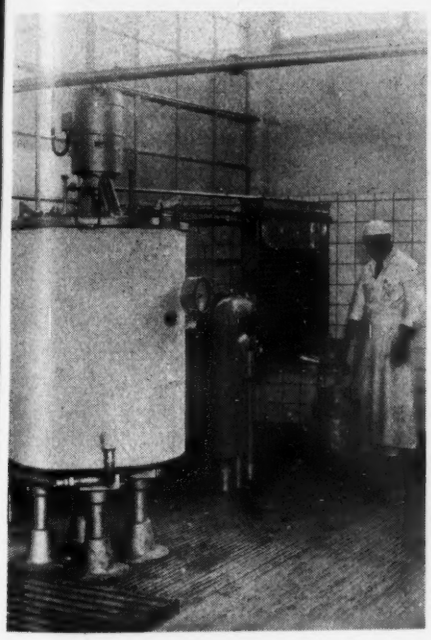
Close-up view of plate-type pasteurizing unit, showing also a centrifugal clarifier and pumps. Note control instruments and sanitary piping.



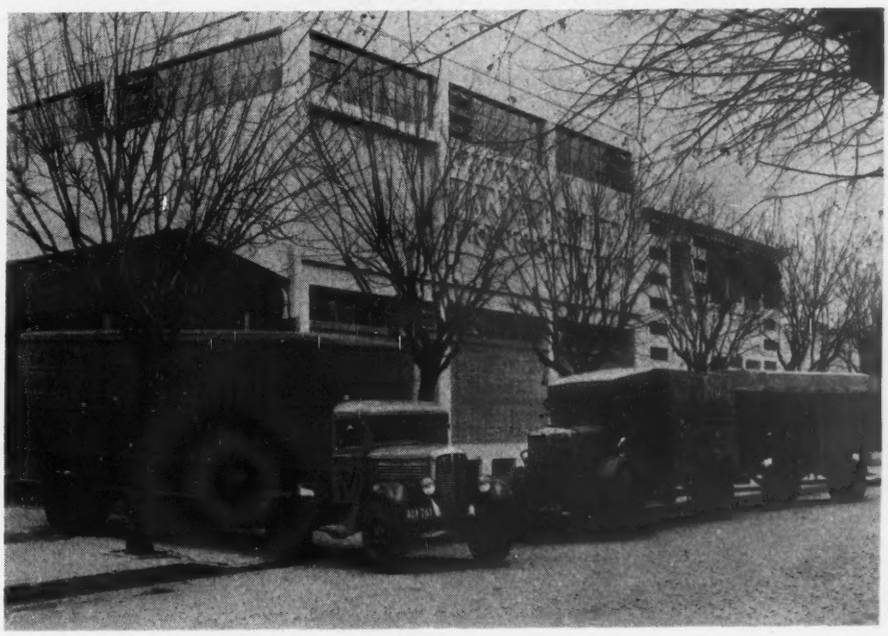
Butter room, showing churn of wood-stave construction. Workers in this plant dress in white.



Underground milk storage, with sanitary white-tile and stainless metal construction.



Milk and cream pasteurizer of holding type and a small cooling unit.



Large trailers and semi-trailers deliver milk to the creamery. Tractor at left is a Dodge. Note modern building in background.

Horse wagons driven by uniformed men deliver the milk.

Simple Method of Closing Bags Saves Metal

By GRACE HIGHTOWER,
Assistant Editor, "Food Industries."

Developed by A & P, it can be used by other food firms. Automatic machines have been revamped to fold tops of bags and crimp the paper to secure the fold. Metal tie-piece is eliminated to make saving of scarce material

FIG. 1. A & P coffee bags closed by crimping fold.

INGENUITY and a very small amount of metal have been combined to produce a new bag closing method now in successful operation on coffee bags at several A & P roasting plants—a method which will save 3,000,000 lb. of metal in a year. Any coffee roaster, it is believed, can construct a similar machine from metal available in his own repair shop.

A & P's coffee merchandising method is based on very rapid distribution to its stores of the roasted whole beans in 1-lb. packages. The bags are opened and the coffee ground as it is sold. The package need not be tight-sealed, but it must keep the contents clean, protected from dust and excess moisture, and must have strength to withstand hasty handling. The package must be so designed that it can be opened easily in the store and reclosed by hand after the coffee is ground.

A greaseproof inner bag is used, with a heavy paper outer bag which also serves as a label. Formerly the bag was closed with a top fold tied down by a paper-covered galvanized steel strip. Since the elimination of the galvanized strip would mean a direct metal saving of about 1,500 tons per year, it was felt to be essential to make this saving. Tests were under way even before the use of metal for this purpose was restricted.

Many substitute closing methods were tried—sewing, gluing, the use of pieces of cardboard, and other means. In every case, whenever a method seemed to be fairly satisfactory, it was found that the proposed material was becoming scarce, or the process required much hand labor or intricate machinery. Any method, to be acceptable, had to be capable of completely automatic operation. Hand closing would so slow the operation that production could not be maintained.

Time and metal for experimentation being limited, the men in charge of packaging determined to lick the problem themselves, "with nothing." They have come close to it. They fold the top of a bag over twice and crimp it shut, all automatically. The folding and crimping are well enough done so that the packages will stand rough handling. The packages also meet the requirement of opening and reclosing easily in the store. And the individual machines units are so small that the 18 required will use only about one ton of metal, mostly pieces that would otherwise go into scrap.

The machine shop, a corner of the coffee department at the Brooklyn plant, is itself an example of doing with nothing. The benches are homemade, the drill press is a familiar mail-order product, now equipped with an oversize motor from a discarded coffee grinder, and many of the small tools came from the mechanics' own home workshops. Yet early in February six crimpers were in operation and the three-man shop was organized on a "production line" basis, making units required to equip the machines in all eight of the company's roasting plants.

Except for the gears, which must be specially cut in an outside shop, the crimping unit is assembled from bar stock and standard machine parts. The technicians who developed the crimper point out that it takes the place of the mechanism needed to cut and crimp the metal tie strips, and to roll and turn the bag tops. The parts now removed accounted for almost one-third of the cost of the original machine. In addition, two small machines which glued paper on the flat sealing wire, or strip, and coiled the wire are not now required.

To put the new closing device into operation at the other roasting plants without unnecessary loss of time, an instruction manual has been prepared by the Brooklyn engineers. For the first two outside installations, the equipment had been adjusted and satisfactory packages were coming through within two hours of the time the crimper was put on the machine.

The construction of the equipment is shown in the pictures. Figure 2 shows the filling table set up for crimping, with the wire closing equipment removed. The bags are filled by gravity, then pass to the clamp shown at top center, which makes a preliminary fold. At the right is the mechanism which forms the initial crease for the crimper. This is an important step in the process. Although the bags are filled to the same weight, within very carefully controlled limits, the difference in size of the individual coffee beans for the various blends makes enough variation in the fill volume so that trouble was experienced in the beginning when changing from one type of coffee to another. When the initial crease is placed at the correct position, the top will fold satisfactorily, regardless of the exact volume of fill. Adjustment of this clamp is very important.

The bag at the lower right in Fig. 2 is ready to pass through the crimping unit. Figure 3 shows the construction of the folding channel. Bags enter from the right, on a conveyor, and are held in position near the top by a pair of small leather belts. Rubber was first tried for the belts, but it will not hold

the bag paper firmly. Leather so far has proved satisfactory. The guides in the folder are twisted from flat stock and are held at the proper spacing by springs and by adjusting the holding clamps.

Determination to save metal and time is evident in the construction adopted. Clamps are bent from flat stock and bolted to the working members, with adjustment slots where they are bolted to the frame. With this construction it has been possible to put experimental units into operation as they were finished. Also, the machine work involved is reduced, for the most part, to a matter of drilling holes or cutting slots, and extreme accuracy in machining operations is not required.

The folded bag top is crimped between toothed wheels, which can be seen in Fig. 4, left center. The entire closing unit is shown in this photograph, and in Fig. 5. Bags are taken off the line by hand and packed in cartons. Operation, except for packing, is entirely automatic and labor is reduced to a minimum.

From Fig. 1 it can be seen that the finished bags are neat and attractive. The fold is tight from corner to corner, and it is possible that further experience with crimping will demonstrate that it is quite as satisfactory as the metal tie-piece, particularly as a method is now being developed to stiffen the top where it is folded.

A & P makes its own bags. Two small printing presses run continuously, except for a nightly shut down of about an hour and a half for cleaning. A substitute gold color now replaces the metallic ink formerly used, but otherwise the label is unchanged. It was not necessary to make any change in the material when going over to crimping.

Bag forming machines are attached to each of the filling machines, so that the inner and outer bags are formed, the outer bag is dated, and the double bag is immediately positioned on the filling table, filled, sealed and packed, the entire operation taking about 25 seconds. Bags are filled at a rate of better than 50 a minute.

Coffee roasters and other food manufacturers interested in using this device should write to the Engineering Department, A & P Coffee Service, 45 Washington St., Brooklyn, N. Y. A & P will try to answer all questions and will make available detailed diagrams of the closure machine.

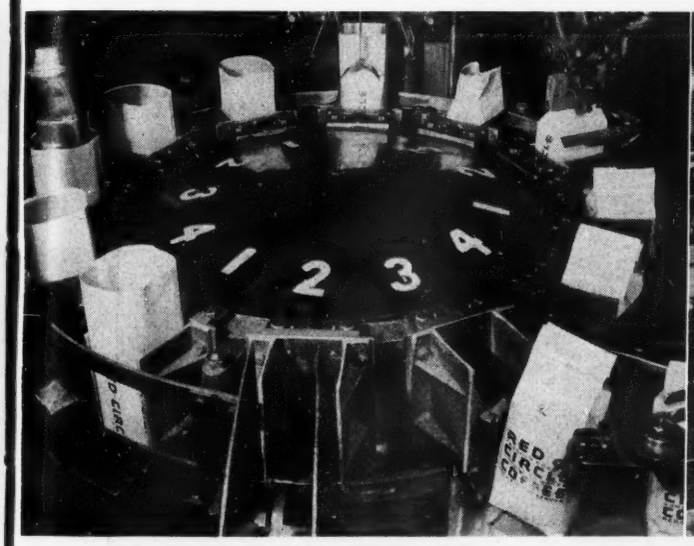


FIG. 2. Filling table of the packaging machine, showing the two clamps required to make the preliminary fold. Crimping-unit conveyor is at lower right.

FIG. 3. One of the first units built for folding the tops of the bags preparatory to crimping. This shows the method of construction adopted to avoid machine work.

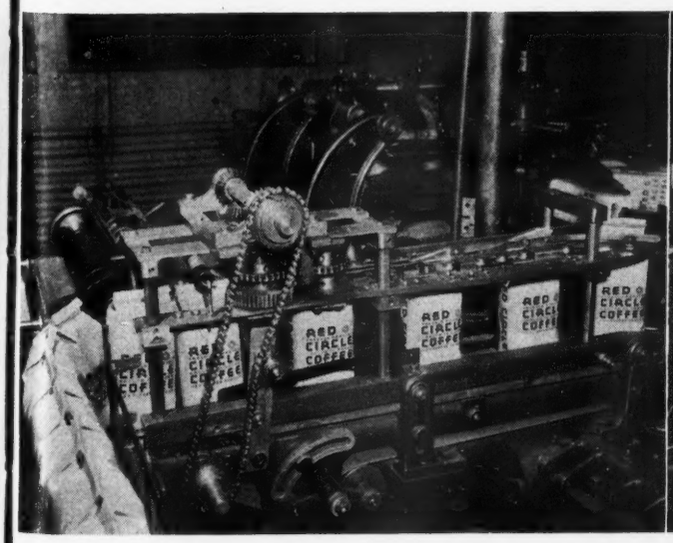


FIG. 4. The crimping unit in operation. Gears are the only parts not made in the temporary machine shop.

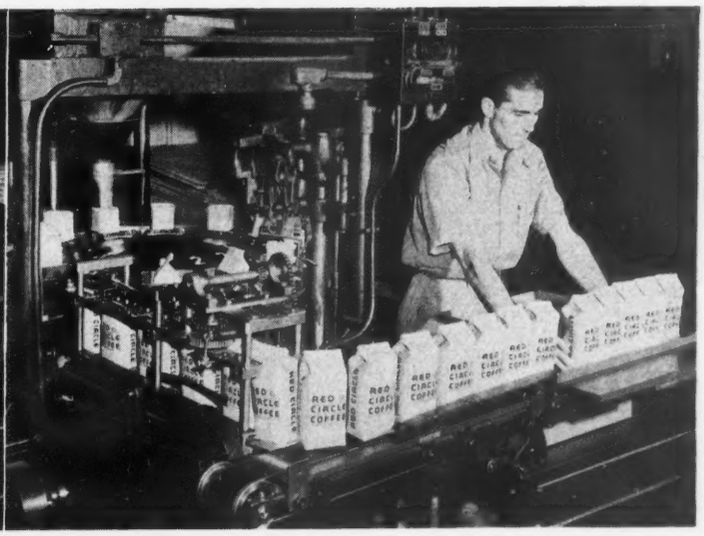


FIG. 5. The filling and closing machine, with the exception of the bag forming mechanism.

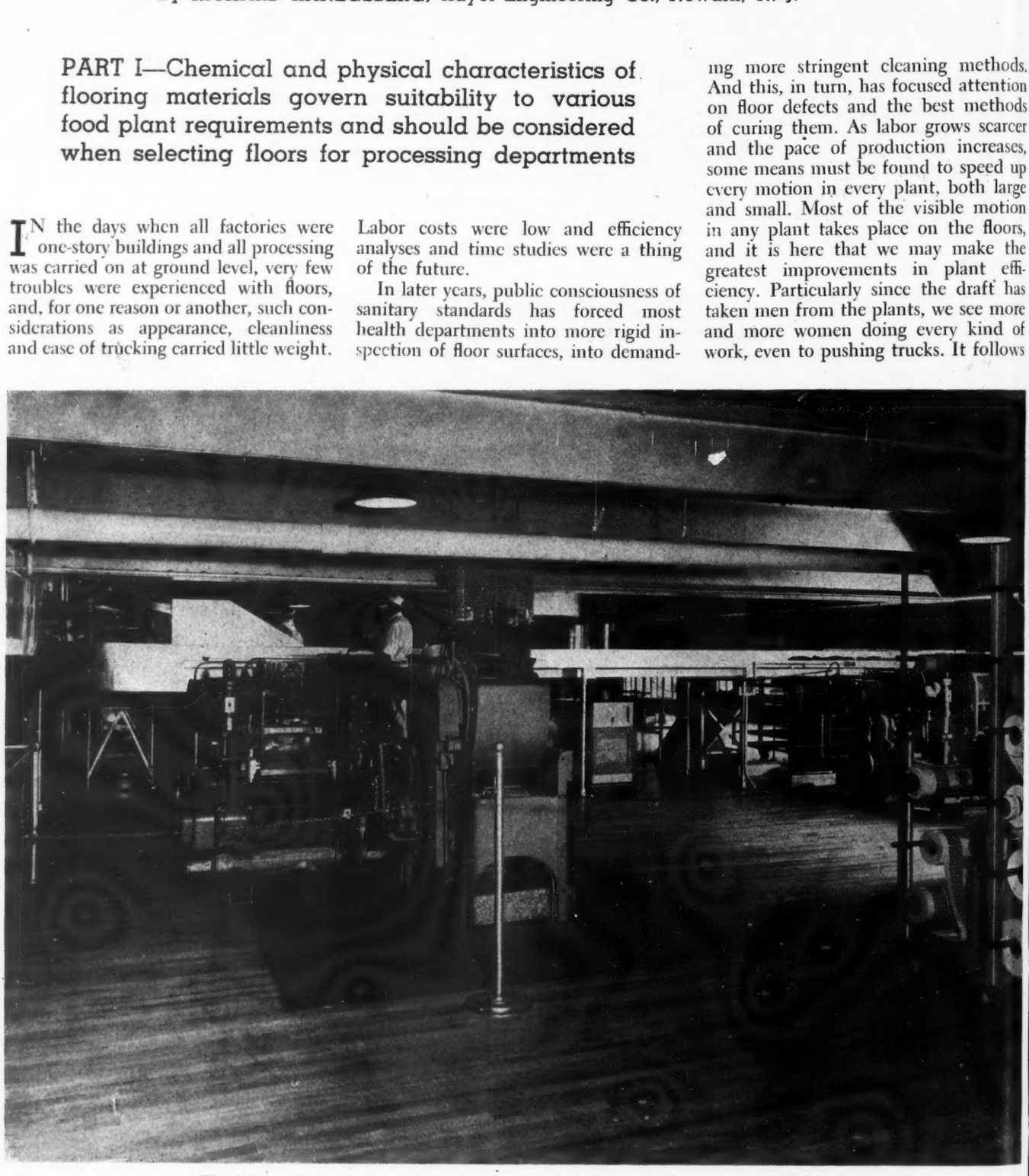
Choose Floors That Withstand Conditions of Processing

By RICHARD KANEGSBERG, Kayel Engineering Co., Newark, N. J.

PART I—Chemical and physical characteristics of flooring materials govern suitability to various food plant requirements and should be considered when selecting floors for processing departments

IN the days when all factories were one-story buildings and all processing was carried on at ground level, very few troubles were experienced with floors, and, for one reason or another, such considerations as appearance, cleanliness and ease of trucking carried little weight. Labor costs were low and efficiency analyses and time studies were a thing of the future.

In later years, public consciousness of sanitary standards has forced most health departments into more rigid inspection of floor surfaces, into demanding more stringent cleaning methods. And this, in turn, has focused attention on floor defects and the best methods of curing them. As labor grows scarcer and the pace of production increases, some means must be found to speed up every motion in every plant, both large and small. Most of the visible motion in any plant takes place on the floors, and it is here that we may make the greatest improvements in plant efficiency. Particularly since the draft has taken men from the plants, we see more and more women doing every kind of work, even to pushing trucks. It follows



Wood floors find extensive use in those areas of food plants where service is light and there is little or no exposure to acids, alkalis or other destructive materials.

that if floors are placed in good condition, the problem of help is reduced proportionately. The easier the floor service, the easier goods move and the less the effort required to move them. Very simple. Study of the labor situation should force consideration of floor conditions.

Processing equipment is now placed all over multistory plants, so that leaking floors become a major problem from a structural viewpoint. The whole field of floor surfacings is none too large when we try to fit the physical and chemical set-up to the right flooring material. Every consideration must be given to the factors of:

a. Chemical resistance.
b. Resistance to surface wear.
c. Resistance to heat or cold.
d. Low absorption.
e. Slip-proof qualities.
f. Cleanability.
g. Sound-proof qualities.
h. Economic cost.

To attempt the evaluation of the various available flooring materials by making any one of these factors predominant is foolish, expensive and wasteful. A definite order of importance should be assigned, dependent upon the individual local conditions; the amount of importance should be determined; and then when several choices of floorings are compared you will have a dependable standard of comparison. The cost factors should be worked out on a probable-cost-per-year basis instead of the usual first-cost basis, taking into account such items as total repairs to be expected during the useful life of the floor, cost of shutdowns, differences in cleaning costs and other related items.

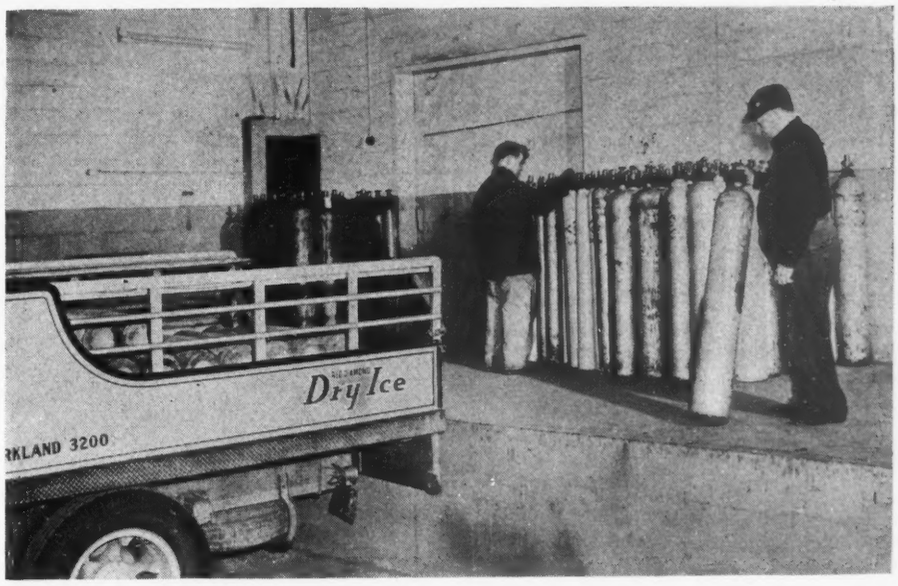
The materials available for floorings fall into several general classifications, the physical characteristics of which are well recognized by all maintenance managers. The chemical resistances of these materials are not so well known and, in fact, many misconceptions and half-truths combine to confuse the average maintenance engineer when he comes to this part of his problem. This article will try, in nontechnical terms, to describe the suitabilities of the various materials for differing services. It is impossible to take up any of the many special proprietary materials, but if the main ingredients are known, it is possible to get some idea of safe uses.

We will first discuss some of the general properties of various well-known flooring materials as related to the usual conditions encountered in food plants.

Wood Flooring

Hardwoods find extensive uses in all types of food plants, being inexpensive, readily obtainable and easily installed or repaired. Dry heat causes shrinkage in wood floors, but no loss of strength or deterioration of the surface. Excessive water causes swelling and loss of color as well as softening of the fiber. Alkaline solutions cause woods to swell and discolor, and a picking-up of the grain in resinous woods. Strong alkalis destroy all woods. Weak acids cause picking-up of the grain and gradual solution of certain components in the wood, and strong acetic acid has a marked corrosive effect. Various brines and salt solutions will cause pick-up of the grain of resinous woods and have a swelling action. Acid salt solutions will act the same as weak acids. Oils, fats and greases of mineral or vegetable origin have little effect on woods even though they are readily absorbed, the only observable effects being due to the solvent action of acid impurities when present. However, the growth of bacteria and fungi will be promoted in the structure of the wood where it cannot be easily eradicated.

There are a number of drying-oils, natural and synthetic resins, and penetrants which may be applied to wood surfaces or forced in under pressure during manufacture to reduce the absorption of oils and water. A fairly effective waterproofing treatment consists of painting the tongue-and-groove joints of wood planks with white-lead paint and then bedding the planks in white-lead paste. Even with this treatment, however, excessive exposure to water may cause swelling of the wood and buckling of the surface as well as curling and warping of individual pieces, bringing on excessive wear in spots. Wet wood floors are softer, and rolling traffic may cause crushing of the fiber and leaching out of soluble components, resulting in splintered surfaces. Wood surfaces covered with oil or water will become very slippery unless periodically treated for the removal of slime growths.



Concrete floors exposed to severe wear, as in the case of this loading platform, often use special wear-resisting material in the top surface—in this case emery aggregate.

Linoleum and Rubber

Sheets or tiles made of linoleum or rubber do not find many applications in process areas. Both materials are subject to the effects of heat and even though they are fairly resistant to the occasional wetting of periodical washing, the effect of constant wetting is a swelling of the material and a loosening of the cementing power of the adhesive which bonds the sheet to the base. Unless the area to be covered is subject only to foot traffic and occasional spillage of liquids that may be quickly cleaned up, these floor coverings are best used in office areas only. Linoleum is attacked by alkalis, but is not affected by weak acids.

Oils and fats will attack and swell linoleum and rubber, making ideal conditions for the support of hidden bacterial and fungoid growths that are not easily removed. If heavy machinery is to be placed on such floors, great care must be taken to spread the load as well as possible since these materials will not support concentrated loads of any size.

Portland Cement

In any discussion of the resistance of portland cement concrete we must take it for granted that the concrete is well proportioned of clean hard aggregates, properly mixed with the correct proportion of water, skillfully placed and thoroughly cured to obtain the maximum density and wearing qualities.

The effect of chemical attack on concrete floors is directly linked with the amount of abrasion and traffic. It must be remembered that concrete tanks may be used to store many liquids which, if allowed to fall on concrete floors, would quickly attack the surface. This condition arises from the fact that the reaction of some chemicals with the components of portland cement produce certain insoluble salts, which, if not disturbed, effectively block off any further reaction and act as a protective coating. Waterwash will have the same effect as traffic, tending to erode the surface, remove the protective coating and expose new and fresh concrete surfaces to the corroding liquid, thus continuing the process indefinitely. It follows that most of the surface treatments advocated for concrete floors must be judged and evaluated from a consideration of the amount of traffic the floor must sustain and the probable amount of erosion to be expected because of liquid wash or cleaning processes. Sometimes the only way to obtain a definite answer is to install a test section in heavily traveled passageways where the floor receives a maximum of traffic combined with corrosive attack. Careful observation of such test areas, checked with adjacent non-test areas, will quickly show the most successful treatment and save much unnecessary expense and trouble. Where such test areas are installed, great care must be taken to protect against side attack at points where the test area adjoins other areas. Allowances should be made for possible deterioration from this source.

Portland cement, being an alkaline material, is not generally attacked by mild alkalis, but salts in solution, whether acid, neutral or alkaline, constitute a danger even to dense concrete. It has been found that certain cleaners used for the regular cleaning of floors have the effect of spalling off the surface of concrete. Some of the cleaning solution is always absorbed by the upper surface of the floor and, when the floor dries, small crystals are left in the pores of the concrete. Further cleaning redissolves these crystals but increases the strength of the solution *in the concrete* until the crystals eventually fill the pores of the top surface to such a degree that in their formation the pressure they exert breaks down the bond of the cement and the surface is loosened. The new surface so exposed is even more vulnerable to attack, and so the cycle continues.

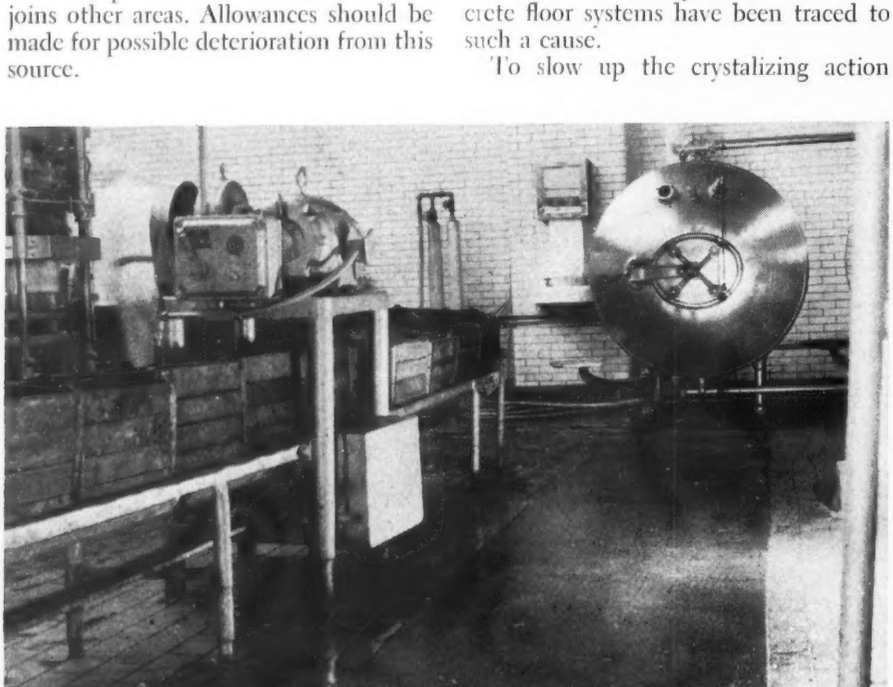
This form of attack is particularly dangerous when it continues to the point where salt solutions may penetrate to the steel reinforcing of the floor, this being much more common than is generally realized. Most steel floor reinforcing carries a good part of the stray electric current that leaks from all electric lines and, wherever such steel is exposed to salt solutions or any other electrolyte, a cell is set up which promotes an exceedingly fast disintegration of the steel with a resulting weakening of the floor, usually occurring along fissures in the concrete slabs. Plenty of failures of concrete floor systems have been traced to such a cause.

To slow up the crystalizing action requires that the floors be thoroughly scrubbed with clean water after the cleaners have been used and the surfaces then flushed with large quantities of warm water. The soluble salts may thus be partially washed out of the surface of the floor. The crystallizing action takes place in all porous surfaces or joints between floor brick and other stone or ceramic materials and, in general, wherever the porosity of the material allows the absorption of salt solutions with alternating wet and dry periods. Continuously wet floors are not affected by this action.

Almost all of the acids, acid salts and acid oils have a deleterious effect on concrete floors and mortar joints, reacting with the cement binder to form soluble compounds and so allowing the aggregate in the mortar or concrete to become loosened and eventually wash out of position. The action is very pronounced where liquids run in streams over the floor, concentrating the flow and intensifying the acid action through the erosion effect of the stream. Other parts of such a floor, although wetted by the same liquids, might show little or no effect because the products of the acid reaction block off access of the acid to new fields of attack. Here the problem of protection becomes a matter of proper design, and it is possible so to arrange the drainage as to concentrate the volume flow in corrosion proof channels where it can do no harm.

The protection of concrete surfaces against corrosion has occupied a large amount of research for many years. Many substances are available to harden the surface, reduce porosity, or to coat the surface with films more or less resistant to corrosive attack. Coatings vary in characteristics from the thin penetrative types to the thicker, surface-borne materials designed to sheath the concrete.

It is perhaps unfortunate that the manufacturers and distributors of some of these materials have seen fit to advertise them with all kinds of irresponsible claims with no real backing of actual service or testing. As a result, some very worthwhile materials have been classed with the worthless nostrums so advertised without having had a proper chance to show their valuable properties. Then again, the practice of giving fancy names to common materials has served to conceal the true nature of some of these products and has actually worked to their disadvantage by classing them with the ruck of catch-penny frauds. The only protection a plant manager has if he wishes to try one of these products is to demand service on a "show-me" basis—try it out on a test basis in comparison with a control



Wear on floors is often most severe in aisles, which can be protected by the use of a specially selected wearing surface, as in this case where the aisle is paved with emery aggregate concrete.

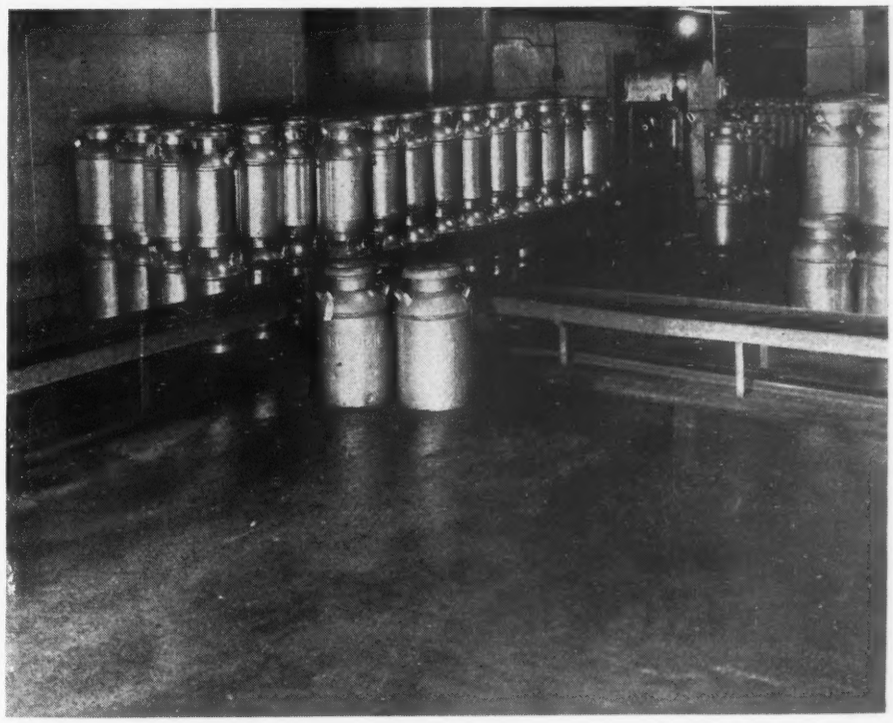
sample and, forgetting all about advertised claims, see for himself how it works in *his* case.

Concrete surfaces may be hardened through the application of solutions of magnesium or zinc silicofluorides, the solutions being made up in a strength of 1 lb. per gallon of water and mopped on the floor. Each coating is allowed to dry, the surface swept clean and washed to remove excess crystals and then additional coatings are applied. The fluosilicates act through the transformation of some of the cement components to harder silicates which tend to fill the pores and harden the surface. However, acid attack or traffic action may tend to break down the protected area and permit corrosion to start.

Further protection may be gained by coating the hardened surface with drying oils such as linseed, tung or soybean oil thinned with turpentine or coumarone resin dissolved in xylol. It is necessary to repeat here that no such surface treatments will compensate for poorly finished or improperly placed concrete. At best such surface treatments penetrate but a small fraction of an inch from the top and if this is worn off or disturbed through mechanical abrasion the effect of the entire coating is lost.

Concrete surfaces may be modified by the use of several types of hard substances embedded in the cement matrix. Such materials as powdered iron, carborundum and natural emery are used for this purpose. Powdered iron with ammonium chloride is used as a topping compound applied while the concrete surface is still setting up, being applied to the still-wet concrete in powdered form and worked in by troweling. Several applications are required to embed the amount needed. The result is a formation of ferrous salts with metallic iron, hard and practically impervious. It is vulnerable to attack by all the liquids affecting portland cement, but to a lesser degree because the harder surface and reduced porosity at the surface slows down the mechanical erosion of traffic. Carborundum is used in the same manner but there is no chemical reaction with the cement, carborundum being used as a hard grit on the surface.

The most promising of the available coatings is natural emery. This is a mined product and is marketed as a graded concrete aggregate ready for use when mixed with the proper proportion of portland cement and water. It is best used as a topping over a prepared portland cement concrete base in thicknesses varying between ½ to 1 in., or slightly more, according to the intensity of the traffic load. Because of the very sharp nature of the aggregate grains, the concrete is strong mechanically and is practically impervious. Emery has a hardness ness of 9 in comparison with diamond at 10 and so resists the wearing action of steel-wheeled and other traffic very well. Although such floors are comparatively new, many milk plants have found them of great value in such areas as shipping rooms, bottling rooms and other spaces where cans and boxes are rolled or transported and where the floors must receive the maximum in cleaning treatment to keep them in sanitary condition. These floors are more resistant to the action of acids and oils than ordinary concrete because of their greater density and the lower absorption of the aggregate.



Specially surfaced concrete protects floor from chemical attack as well as severe wear in this milk chill room, where emery aggregate is used in upper part of floor slab.

Vegetable or animal oils or fats attack concrete because of the fact that they contain free fatty acids in varying degrees. In general, chemists agree that the free calcium hydroxide present in the set cement reacts with these to form a calcium salt of the fatty acid and furthers reactions which are possible with all saponifiable oils. The reaction is more rapid on a floor as the action is speeded up in the presence of air and water. Aluminous cements are slightly more resistant to this reaction.

Sugar solutions have a very marked corrosive effect on concrete, but dry sugar has little if any effect on good concrete. The temperature of the sugar solution has a large bearing on the speed of attack—hot solutions, particularly when fruit acids are present, having the most violent action.

Concrete floors are deservedly popular and are most successful, particularly when built by skilled masons specializing in this type of work. However, when concrete is being considered for a problem floor, careful study must be made of the many factors involved, to make sure that the finished surface will withstand all the destructive forces involved. When we know that every one of these forces is checkmated by a corresponding quality of the floor, then we can be sure that the floor will endure.

Part II of this article, discussing the characteristics of floors constructed of asphalt, magnesite, brick and tile, will appear in the April number of Food Industries.

The Complete Story

To get a complete discussion of the many aspects of the complex problem of floors for food processing plants, readers should combine previous articles published in Food Industries with the foregoing floor story and with Part II which will appear next month. These earlier articles, all written by Richard Kanegsberg, include: Why Floors Fail in Food Plants, Food Industries, July, 1941, page 37; and Select Floor Materials To Suit Plant Needs, Part I, July, 1942, page 56, and Part II, August, 1942, page 53. Selection of proper materials and best methods of construction are covered.—The Editors.

Salvage—a Duty As Well As Good Business

Scrap is essential to war production, and 75 to 80 percent of it must come from industrial plants. Besides it is efficient management to get rid of obsolete equipment and materials

Part of the 14,390 lb. of scrap recently contributed by Kroger Grocery & Baking Co., Cincinnati, being dumped into a railroad car. This is tin from containers used to ship ingredients to the company's factory in Cincinnati.

IT is not enough when a food manufacturer goes all out in the processing of food for the armies and civilians of the United Nations. Nor is it enough when he converts his maintenance machine shop to the manufacture of parts for guns, tanks or planes. No, the food manufacturer, nor any other manufacturer, has not done enough until he has supplied some metal and rubber that can be used to build ships and tanks and guns and the other things needed in tremendous quantities to help win this war.

It is no exaggeration to say that in most plants there is some idle metal that is not serving any useful purpose in the war effort. Nor is it an overstatement to say that the management of any food plant which does not get in its scrap is guilty of helping to prolong the war. Furthermore, it is bad business not to get rid of useless or obsolete equipment and materials—more will be said about this later.

Why is it that scrap is so essential to the war effort? Just this. Approximately half of every finished steel product now serving as implements of war on the rapidly expanding battle front or as industrial machinery on the production front is made of scrap. And 75 to 80 percent of this scrap must come from industry.

As one would expect who is familiar with the type of men who direct the operations of the food industry, this industry has been contributing much to the salvage program, and some astonishing figures will be given presently. But the point should be made here that the management of each food plant should take on, if it has not already done so, the responsibility for getting scrap collected and sold to a local junk dealer. Management should by all means cooperate with industry and local salvage committees, but it is not necessary to wait for such a committee to tell you what to do. The need is self-evident. The procedure is simple. Here's what to do.

Management should give an executive in the company authority to decide what can be scrapped and what can't. Then a salvage manager should be named for each plant. It should then be made the duty of the salvage manager to go through every department and every corner of the plant in search of something that can be sold for scrap, or that can be sold to another manufacturer who needs it. Where a plant is too big to be handled by one man, a salvage committee can be formed with a member from every department. The salvage manager ought to prepare a complete inventory of idle material and equipment and should tag everything not in use. Nor is this a one-time job—it requires follow-up because the need for scrap is constant and its collection in the plant continuous.

What to Scrap

When the salvage manager in his inspection of the plant finds something he believes should be scrapped, he consults the man in charge of it, probably the department head. And if the man in charge can't show where it has been used in the past season or where it is to be used next season, then it's scrap. In event the man in charge is afraid to let the thing go, the salvage manager consults the executive who has the authority to make that decision. And here it should be mentioned that the entire organization ought to be sold on the need for scrap salvage. This will ease the task of the salvage manager and make his work much more fruitful.

The eyes of the salvage manager should be sharp—and keen his perception of what is useful and not useful. It might be an advantage for him to be a man who has not been too long about the plant. If relatively new to the premises he will question the usefulness of everything not at work, while if he has been around for years that pile of pipe lengths or sheet metal, that idle overhead lineshaft, or that old metal chute may seem to him like permanent plant fixtures.

It is not possible to give a detailed list of what is scrap for any one plant without going through that plant with a fine-tooth comb, and that is the duty of the salvage manager. But in searching for scrap, don't overlook a single piece of metal, rubber or paper in the factory, in the storerooms or in the yard around the buildings. The effective salvage manager looks each object squarely in the eye and asks what it has been doing and what it's going to do in the near future. He remembers that this is no time to save "string." Uncle Sam needs that "string" to hang Hitler—that piece of pipe to maul Mussolini—that discarded steam coil to boil Hirohito in oil.

Aside from the very great advantage of helping the war effort, scrap salvage has other benefits to the manufacturer.

Every good business man knows that it pays from the viewpoint of business economy to salvage obsolescent equipment. This becomes especially pertinent when you consider that there will be terrific competition for the postwar market, with the lower cost operators having an advantage. Those who get rid of obsolete equipment now and replace it with new when the war is over will be the lower cost operators. The better managed companies, in fact, conduct a salvage campaign within their plants in peacetime as well as wartime.

Salvage is Good Business

Tax deduction for scrapped equipment not previously fully depreciated is an additional reason why industrial scrap housecleaning is synonymous with good business. And yet another is the fact that the floor space sometimes taken up by useless equipment in the plant may easily be worth more than the equipment.

As mentioned earlier, some of the food industries have been doing a remarkable job of scrap salvage. To take an outstanding example for which statistics are at hand, the dairy industry to date has turned in 18,131,086 lb. of scrap, much of which is alloy steel and scarce nonferrous metals and rubber. The Dairy Industries Supply Association recently completed a nationwide campaign in 25,000 plants. This scrap drive cost $2,300, and while it was done as a patriotic move to help the war effort, it has been hinted unofficially that this excellent work will be taken into consideration in releasing metal to the dairy industry for maintenance, repair and replacement.

A Job Well Done

Industry and Federal organizations cooperated in promoting this drive. The 200 companies with DISA membership sent out between 2,000 and 2,500 salesmen to spread the word in the dairy processing industry, asking superintendents and foremen to collect scrap and dismantle old machinery. DISA twice canvassed all 25,000 dairy plants by direct mail, sending out cards to be filled in with reports on the progress of each company. All of the national, state and regional associations of dairy processors were called upon to support the drive. Advertising expenses for the campaign were shared by DISA and the larger dairy companies, the latter donating space while DISA originated copy and supplied the plates.

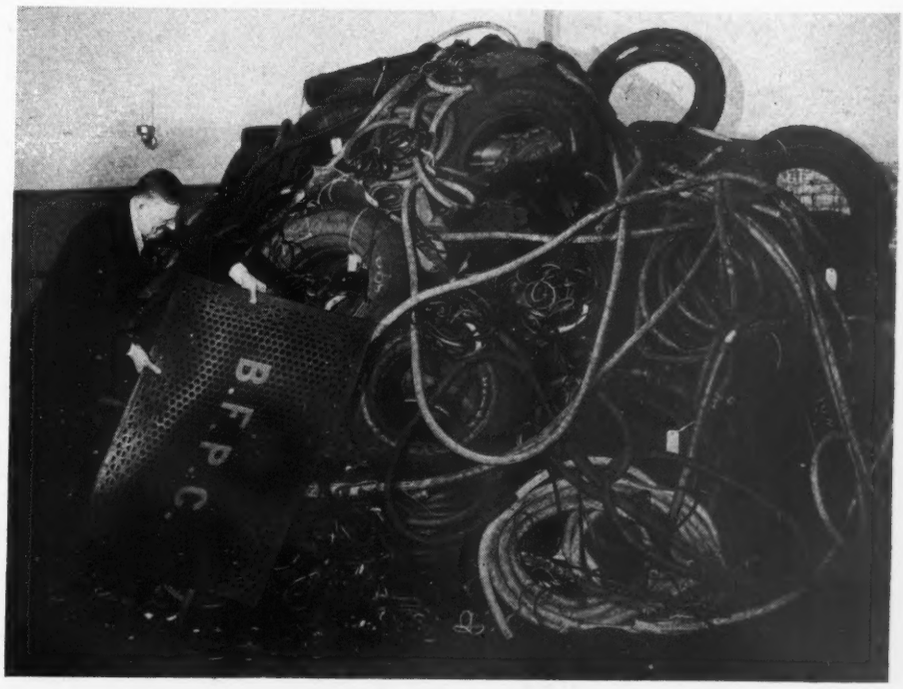
The success of the drive is in large part attributable to the fact that the Association's efforts were adjusted to those of local and state salvage committees.

The dairy industry is not alone in effective salvage work. The beverage bottlers, meat packers, fish processors and others have also done a good salvage job.

Many individual companies, too, have done outstanding work in scrap salvage. Between March 1 and October 27, 1942, National Biscuit Co. turned in 2,224,700 lb. of scrap, a remarkable performance. And over 200 tons of scrap metal was yet to be realized from equipment on which the authority to scrap had been issued. This bakery company's scrap included large quantities of tin, light and heavy iron, waste paper, brass, copper, aluminum and rubber.

But regardless of the good work done to date, the management of each plant in the food industry should consider scrap salvage a duty that is to continue for the duration—and don't forget that it is good business, too.

Pile of scrap collected by Swift & Co. at Kearny, N. J.



William H. Marcussen, president of Borden's Farm Products Division of The Borden Co., tosses the rubber mat from the Borden Building at 110 Hudson St., New York, onto the pile of scrap rubber assembled at one of the company's plants.

Converts Food Trailer To Bus for Workers

Vehicle that will carry 80 volunteer farm laborers to the fields in safety and comfort developed by Seabrook Farms. Can easily be altered to haul foods

PROVED successful by the acid test of operation, the idea for converting conventional trailers into buses for carrying volunteer farm workers to the fields gives promise of wider application. Seabrook Farms, Bridgeton, N. J., is using four converted trailers, and these may be a solution to the problem of transporting the "save the crops" workers who are to help harvest Uncle Sam's food crops this year for the benefit of the United Nations.

The idea is three-pronged—to provide temporary mass transportation at low cost, to carry the workers as human beings instead of herding them together like cattle, and to be able to use the vehicle for ordinary farm or over-the-road haulage without additional expense after the crops have been harvested and until the need for hauling workers again arises.

All of these requirements were met in the Seabrook Farms trailer conversions, one of which is illustrated on these two pages. Four such conversions were made, the cost of each being $1,084. However, the cost of converting smaller vehicles would be correspondingly less.

Each converted trailer-bus provides a comfortable seating for 80 persons with the maximum of safety and with adequate ventilation. Taking out the removable benches and covering the top and half of the sides with a conventional, open-top trailer canvas tarpaulin permit the trailer to be put back into its usual work of hauling crops or other food products.

When the farm labor shortage began to get serious last summer and fall on account of the war, Seabrook Farms first experimented with the use of a conventional, straight-framed closed trailer. Temporary makeshift seats were installed and the floor covered with straw.

When there were not enough seats for all the workers carried, some sat in the straw on the floor. This made for very uncomfortable riding, and the straw set up a serious fire hazard in case one of the riders sneaked a smoke and did not make certain that all fire in the butt was extinguished before he threw it away.

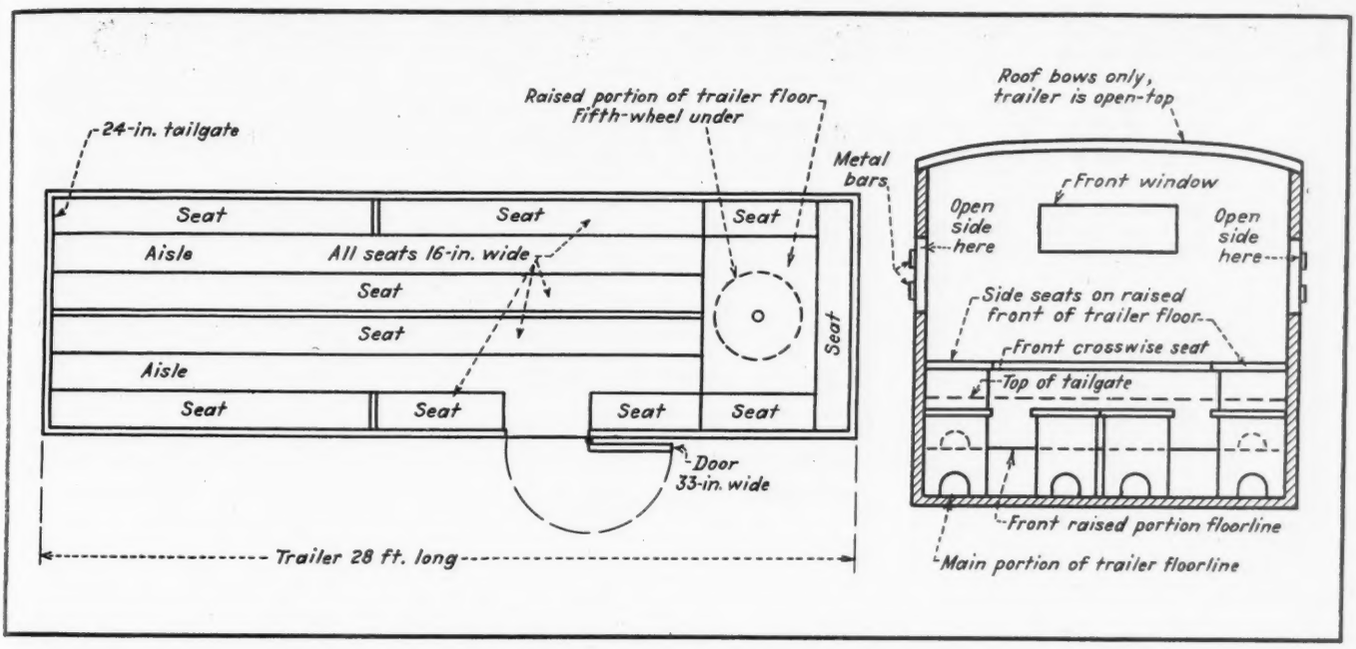
Some of the first riders complained that in the closed body they could not see where they were going, that the ventilation inside was poor and that they felt as if they were being herded like cattle. All of this was not conducive to city dwellers spending their week ends working in the fields at Seabrook Farms.

In addition, there was a big turnover in the number of volunteers. Those who came one week end and got a bumpy, uncomfortable ride and "were hauled around like cattle," as one of them put it, did not show up the next week end, and new volunteers had to be recruited.

It was to overcome all these complaints that A. A. Kuehn, transportation superintendent of Seabrook Farms, finally worked out the converted trailer-bus described here. It is based on a conventional straight-framed semi-trailer with a 28-ft. open-top body.

The first and most expensive step in conversion involved dropping the floor level to eliminate the discomfort caused by riding above the center of gravity. There is a "gooseneck" at the front end of the trailer frame, and the floor formerly was laid on 4-in. horizontal wooden cross members placed on a plane level with the top of the goose-

Eighty volunteer "save the crops" farm workers can be carried at one time in this converted trailer-bus devised by A. A. Kuehn, transportation superintendent of Seabrook Farms, Bridgeton, N. J. Because of the increased farm labor shortage anticipated during 1943, this type of vehicle may have wide application on American farms this year. It is a 28-ft. trailer converted at a cost of $1,084. The volunteer workers shown are pupils from the Bridgeton, N. J., high school.



Plan and rear views, on different scales, of the Seabrook Farms converted trailer-bus body. Both views show the arrangement of the benches, which can be removed easily to enable the vehicle to perform its regular farm or over-the-road haulage. Other details of the conversion are also shown. A side door permits passing into and out of the body without climbing over the tailgate.

neck part of the frame. This made the cross members 8 in. above the frame back of the gooseneck. In the conversion, the cross members were eliminated and support for the floor obtained from cantilever beams or outriggers riveted and welded to the exterior of the frame. The floor is now directly on the frame, and back of the gooseneck it is 12 in. lower than formerly. At the gooseneck bend, there is a vertical rise or "step" in the floor, and the remainder of the floor is on a level with the top of the gooseneck frame, 8 in. higher.

The effect of this change is to provide much easier riding qualities because of the floor level being below instead of above the fifth-wheel support.

Next, nine benches, each 16 in. wide, were put into the body, in three sections along each side, two sections in the center and one across the front end of the trailer, all as shown in the accompanying drawings. These benches seat 80 people, as compared with only 55 in the trailers first used.

The benches are all 20 in. high, or 4 in. lower than the 24-in. tailgate. This eliminates the danger that any of the riders will slide off the benches at the rear in the event of sudden starting and stopping.

Then, to provide ventilation in addition to that supplied by the open top of the trailer, especially in rainy weather when a tarpaulin cover is employed, 2 ft. of trailer wall on each side was removed. This gives rectangular, window-type openings, without glass.

Two parallel, horizontal metal bars were placed across the windows, thus making it impossible for any of the riders to crawl out of the windows while the trailer is in motion and be injured. Jiffy rain curtains are provided inside the windows and can be pulled across the openings in bad weather.

Besides providing better ventilation, these windows enable the riders to see where they are going, and together with the seats (instead of straw on the floor), they tend to eliminate that closed-in feeling of being herded together like cattle.

The entire interior of the body is painted in two tones. The floor is dark green and the side walls tan. This makes for cleanliness; and without straw on the floor the riders are permitted to smoke. As an additional precaution, both the inside Jiffy curtains and the tarpaulin top cover have been treated with a fire-resistant preparation.

The exterior of the trailer is painted Morat green. Besides having a fresh green color, the body is kept well washed to buoy up the spirits of the neophyte farmers on their way to and from work.

In operation, the trailers are sent into town to pick up the volunteer workers previously arranged for at designated times and places. If high school students are among the workers, they are accompanied by monitors, usually seniors or, in some cases, teachers. Women teachers supervise the girls and male teachers handle the boys.

Entrance to and exit from the trailer body is through a 33-in. solid wood door on the right side about 6 ft. to the rear of the raised front end of the trailer. A bench-like step is used to reach the ground from the trailer floor.

After arriving at the fields where the volunteers are to work, the tractor and trailer may unload its workers and return to town for another group. Or in case of threatening weather, it may be parked in the field to serve as a ready refuge for the workers in case of sudden rain.

The first of the fleet of four such converted trailer-buses was originally tried out by a group of Bridgeton, N. J., high school pupils. They were enthusiastic about the improved riding qualities of the unit and the elimination of the things which caused complaint against the original conveyances.

To get the body back into its usual work of hauling farm products, all that is necessary is to remove the benches and store them away until the next crop season rolls around. The side door may be used for side loading or locked shut for conventional rear-end loading and unloading.

The side-wall boards removed to form the glassless windows may also be replaced to provide a solid wall if desired, although this is not necessary except when carrying goods which might fall out through the openings. With large-item goods, the metal bars on the outside of the body will keep anything from falling out while in transit. The entire top of the open-top body can be closed in by the use of the conventional canvas tarpaulin.

Control of Thermophilic Bacteria In Canned Meat Mixtures

By L. B. JENSEN and W. R. HESS, Research Laboratories, Swift & Co., Chicago, Ill.

Experimental tests show that controlled heat treatment in sealed containers and the presence of salt and an oxidizing agent prevent anaerobic fermentation spoilage of canned protein foods

PRESENCE of thermophilic spore-forming bacteria in soybeans and soya flour, grits or meal has become an important problem in connection with canned, finely ground meat mixtures having these materials as "extenders."

Results of a current study of the problem show that thermophilic spoilage of canned, finely ground meats containing contaminated soya flour and grits will not take place in 50 days if specific conditions of treatment are observed. The conditions determined thus far are that: (1) The meat be cured with 3½ lb. of sodium chloride, 2½ oz. of sodium nitrate and ⅛ oz. of sodium nitrite per 100 lb. and (2) the mixture be retorted in the can at 235 deg. F. for 3 hours, 20 minutes. Contents of cans retorted at 235 deg. F. but not containing the 3½ percent salt and curing mixture swelled in a short period of time and usually burst at the seams because of the activity of the gas-forming thermophiles at 132 deg. F. The "cure" is the amount normally used in most varieties of canned luncheon meats. As the study continues, other effective conditions may be determined.

The problem of thermophilic bacteria in products containing soya flour and grits is not a new one. Soybeans have long been known to harbor many bacteria which are highly heat resistant in their spore state. Some of the spores resist the effect of 290 deg. F. for several minutes. Most of them resist effects of water-boiling temperature (212 deg. F.) for as long as 22 hours.

Fortunately, thermophilic bacteria are not pathogenic, *i.e.*, not disease producing. Their action does result in making canned foods unfit for human consumption and often causes bursting of the cans. Since their thermal resistance precludes normal heat treatment alone as a sterilizing agent, methods which do not involve destructive heat treatment have been sought to stop the activities of thermophiles in canned foods.

Knowledge that thermophilic bacteria cause spoilage in canned foods has been known since 1912.[1] That discovery led to cooling canned foods as rapidly as possible after removal from the retort to 90 deg. F. before stacking.

This procedure was followed with canned dog food containing soybean protein. However, a considerable number of burst cans (bombage) resulted because gas-forming thermophiles found suitable temperatures for activity during exposure to summer heat. Likewise, canned vegetables of various kinds have been known to swell because of gaseous fermentation by thermophiles in tropical regions where the foods were not kept refrigerated or protected from the heat of the sun.

These occurrences, supported by fermentation studies, show that thermophilic bacteria grow best at about 132 deg. F. They will grow in a temperature range of 115 to 150 deg. F.

Bacteriological examinations have shown the presence of thermophilic bacteria in canned meats.[2] However, to date, we have not observed thermophilic spoilage in the usual run of canned meats. Such spoilage of canned meats that has come to our attention has been bombage in canned dog foods.[3] These observations led us to investigate the ingredients in canned meats which might inhibit gaseous fermentation, acid fermentation and proteolysis.

Canned dog foods are known to contain less than 1 percent sodium chloride and no added sodium nitrate. Also, the canned dog foods under observation were subjected to a heat treatment that is greater than is necessary, by scientific data, to destroy the spores of *Cl. botulinum*, but not sufficient to kill thermophilic spores. Further, these canned dog foods contained fermentable soya flour as an ingredient.

When a combination of meats is used, each component is batch-weighed into metal utensils preliminary to manual loading into silent chopper. Upon discharge from chopper, the blend is loaded by elevating screw conveyor into double-arm mixer for further blending preparatory to transfer to stuffer.

Making of meat-cereal mixtures involves the same equipment as does making a regular meat loaf. Meats are transferred from plate grinder to double-arm mixer by means of a metal vat on wheels and an elevating screw conveyor.

Since most canned, cured, finely ground meats contain cucrose, that possible factor in canned meat bombage cannot be overlooked. Gas-forming thermophiles can ferment sucrose or the constituents of soya flour equally well. To give sucrose-containing canned finely ground meats a satisfactory shelf-life they are heat-treated to an inside temperature of at least 225 deg. F.

In the light of these observed facts, conclusion was drawn that the prevention of thermophilic spoilage in canned cured meats heat-treated at processing temperatures must depend upon the 3 to 3.5 percent of sodium chloride or the sodium nitrate (2⅓ oz. per 100 lb.) present in the meat.

As a follow up on these observations, a test was conducted with a batch of finely ground luncheon meat consisting of pork and beef. To this meat was added 10 percent of soya flour having 1,000,000 spores of gas-forming, anaerobic thermophiles per gram of flour. One-half of the meat and flour mixture was cured with 3½ lb. of sodium chloride, 2⅓ oz. sodium nitrate and ⅛ oz. of sodium nitrite per 100 lb. of meat. The other half was not cured at all.

Each of the two lots was stuffed into twelve 6-lb. cans, evacuated, sealed and retorted for 3 hours, 20 minutes at 235 deg. F. to attain an inside temperature of 225 deg. F.

The two lots of 12 cans each were placed in the 132 deg. F. incubator. After three days the uncured lot of 12 cans had swelled, and in five to six days had burst. The cured lot of 12 cans did not swell in 50 days. At the end of the 50-day period, some of the cans of the cured meat-soya-flour mixture were asceptically opened and cultured. A large number of the fermentative thermophilic spores were still alive.

A second test was made involving the use of soybeans. Raw soybeans as received from the grower were ground in a hand mill and added to finely ground luncheon pork to give a 20 percent content. The ground beans showed over 100,000 gas-forming anaerobic thermophiles per gram.

The mixture was cured with 2⅓ oz. of sodium nitrate, ¼ oz. of sodium nitrite and 3½ lb. of sodium chloride per 100 lb. and stuffed into eight 6-lb. cans. The cans were evacuated, sealed, retorted for 3 hours, 20 minutes at 235 deg. F. to give an inside temperature of 225 deg. F. and incubated at 132 deg. F. for 50 days.

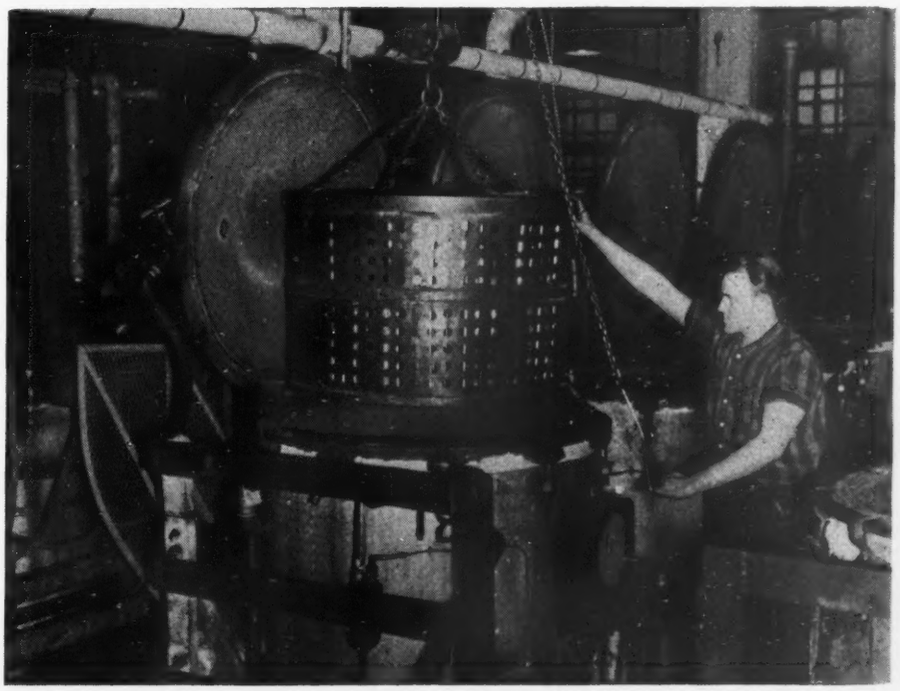
None of the cans showed spoilage. When opened aseptically and examined bacteriologically, their contents were found to contain approximately 1,000 live spores per gram of mixture. Also present were live flat-souring thermophilic spores.

Several other lots of finely ground pork and luncheon meat (mixture of pork and beef) containing 10 percent contaminated soya grits were cured with 3½ lb. of sodium chloride, 2⅓ oz. of sodium nitrate and ⅛ oz. of sodium nitrite per 100 lb., canned, retorted at 235 deg. F., and incubated at 132 deg. F. for 50 days. Although the soya grits used contained 1,000,000 gas-formers per gram, no spoilage resulted.

Although our studies are being continued to obtain more conclusive data, we conclude, from the data already obtained, that spoilage in canned meat mixtures, attributable to thermophiles, can be eliminated by curing with 3½ lb. of sodium chloride, 2⅓ oz. of sodium nitrate, and ⅛ oz. of sodium nitrite per 100 lb. if the 6-lb. cans and contents are retorted at 235 deg. F. for 3 hours, 20 minutes after evacuating and sealing.

References

1. B. Barlow, 1912 Masters Degree Thesis, "A Spoilage of Canned Corn Due to a Thermophilic Bacterium," University of Illinois Libraries, Urbana, Ill.
2. L. B. Jensen, "Microbiology of Meats," Chap. 10, p. 195. Published by Gerrard Press, Champaign, Ill., 1942.
3. "Microbiology of Meats." Chap. 10, p. 196.



In retorting canned meat-cereal mixtures, temperature indication by recording instruments is preferred to gage pressure reading. Failure to expel all air from retort before closing valve will give erroneous gage pressure reading, and resulting temperature is likely to be less than the recommended 235 deg. F. for 3 hours 20 minutes.

Quality and Profit in a Nickel's Worth of Cup Cake

By W. R. VAN METER, Kingston, Pa.

It is said that Philadelphia's largest cake baker first made chocolate cup cakes to use up scrap. But today these are the mainstay of the large baker specializing in 5-cent packaged cakes. Here are practical production and quality control pointers

WHILE the story may be apocryphal, it is related that the largest cake baker in Philadelphia first began to manufacture the now familiar 5-cent package of chocolate cup cakes as a byproduct of his regular baking. Today, of course, for the large-scale baker specializing in the field of 5-cent packaged cake, these same chocolate cup cakes are his mainstay.

Yet it is told of the Philadelphia concern that its very profitable chocolate cup-cake business was quite literally thrust upon it. While the sales policy of the firm from the beginning was to "ration" its outlets and so eliminate any stale returns—a policy, by the way, still unique in the baking industry—there nevertheless accumulated each day in the plant a certain amount of broken or cull cake from the day's production.

Seeking a means of salvaging something from this clean but unsalable cake, it was decided to incorporate it into a chocolate batter and bake this in the form of cup cakes. Since the quantity of cull cake available was limited, the sale of the cups was not particularly encouraged by the firm.

Unwanted Business

The cakes, packaged two for 5-cents in a glassine wrapper, hit a market that apparently was waiting for nothing quite so much as chocolate cup cakes. Virtually overnight it became a case of the tail wagging the whole dog. For a number of weeks the company tried its best to discourage the sale of the new item, not wanting to bake any more than just enough to utilize its cull cake.

Then, helpless in the face of the demand, the company began to bake cake specifically intended to be broken up and used in the manufacture of chocolate cups. From then on, for hours each day in that plant, they have baked cake which had no other purpose than to form an essential part of the "breakage paste" which is one of the ingredients in the formula for their chocolate cups.

The incorporation of this "breakage paste" in the chocolate cup batter is, in the opinion of this writer, vital to the eating and keeping quality of the cake. It gives a tastier, richer eating cake with greatly improved keeping qualities. This last point is important in view of the fact that ordinarily one must expect packaged cake to remain in fresh, good-eating condition up to within eight days after baking.

In the sense that the chocolate cup cake requires the addition of cake crumbs it is quite different from other batters handled by the commercial cake baker. At the same time it is probably the most popular cake made and, potentially at least, the most profitable.

Production Variables

Most of the general problems of mass production are met with in handling this particular cake, as well as a few which are peculiar to it alone. It is therefore the purpose of the writer to discuss briefly some of the variables entering into large-scale production of this cake.

Probably the three most important variables affecting eating and keeping quality are: Type of flour used, the way in which the batter is mixed, and the handling of the breakage paste.

The breakage paste or crumb stock, or whatever the plant name for the material happens to be, ordinarily is not given the consideration it deserves. Frequently there is no attempt made to keep it of uniform composition; it is made the catch-all of the plant, and everything is turned into the chocolate cup on the theory that it will be "hidden" there.

Unless the composition of the cull cake in the plant is fairly uniform, which is rarely the case, it will pay to bake sufficient cake to constitute a determining percentage in the breakage paste. If a cup cake of consistent quality is to be made, then the day-to-day composition of the breakage paste must also be uniform. This is a point that is very hard to get across to the typical baker, for it usually seems downright wasteful to him that cake should be baked and then broken up.

The batter used in making the breakage cake is patterned after the chocolate cup batter, but along less expensive lines. Shortening may be cut out of the formula, as well as chocolate liquor and breakage paste. Sugar and cocoa percentages probably will be reduced. With this cake, eating and keeping quality are not the important characteristics they are with other cake. The breakage cake is only an intermediate material in the production of the chocolate cup.

In the preparation of the breakage paste, predetermined amounts, according to the formula worked out as giving the best results, of normal cull cake from plant operations and the special breakage cake described above are mixed with what is known variously as "thick milk," "milk stock," "starch milk," and the like. No matter what the name, this ingredient is a mixture of sugar, corn starch, skim milk and condensed milk which has been cooked to the gelatinization point of the starch. The mixture is then cooled, run into cans and stored at refrigerator temperatures until it has set to a firm mass.

The starch "pudding," cull cake and breakage cake in amounts called for by the formula are then dumped into a mixer, where during the mixing operation the cake is reduced to a homogeneous paste. It is then run out of the mixer into cans and stored again under refrigeration until it has set up firmly. At this time it is a smooth, chocolate-colored paste and ready for use in making chocolate cup cake batter.

The flour ordinarily used for chocolate cup cakes is a soft winter wheat flour, having a protein content of approximately 8.5 to 9.0 percent; ash

approximately 0.37 to 0.40 percent; and a pH of 5.6 to 5.7.

The importance of the particular flour used depends largely upon the mixing procedure followed in the manufacture of the cups. There are two methods of mixing chocolate cup batter, one in which the gluten of the flour is fully developed and the conventional method in which the gluten is but slightly developed. The sequence of addition of ingredients is the same in both cases.

Shortening and sugar are creamed together. Then the breakage paste, flour and dry ingredients are added and mixing continued. It is customary with this batter to split the baking powder into the sodium bicarbonate component and the monobasic sodium phosphate component. The sodium bicarbonate goes into the mix with the flour and other dry ingredients. The monobasic sodium phosphate is added to the egg whites or albumen solution, and with the addition of powdered sugar is whipped to good volume at the same time the remainder of the batter is being mixed.

Where the gluten is to be developed fully, mixing of the batter is continued for 15 minutes after the addition of the flour to the batch. By the end of the mixing period, the batter should "sheet" smoothly from the hand. But in the partial development method, mixing is rarely continued more than 2 or 3 minutes after the flour has been put in.

In either case, the addition of the whipped mixture of egg whites, powdered sugar and monobasic sodium phosphate to the batter is the same. Mixing is continued only long enough to distribute the beaten whites uniformly through the batter.

Where the mixing is intended to develop the gluten structure of the batter to the limit, the particular flour is of the utmost importance. On the other hand, using the more conventional method the type of flour used is of secondary importance. Between the two methods of mixing, the first gives a better eating and keeping cake, though it demands a much greater degree of control over all the variables involved than does the conventional method.

In either case, batter temperatures and batter densities are variables that should be held closely within the limits that experimentation has shown to be best adapted for a given plant in producing the desired type of cup cake. It is quite true that, taken alone, the rigid control of any single variable contributes only slightly in raising the quality of the cake. However, trite but unquestionably true it is that "Mony a mickle makes a muckle," and the tongue and pocketbook of the customer react to that eventual "muckle."

Production Layout

The accompanying diagram of a mixing and baking layout for the production of chocolate cups illustrates one approach to the engineering problems involved.

Batter from the mixing machines is dumped into tanks which are run on an overhead monorail from the mixing room to the depositor. Tanks are inverted and emptied into the depositor hopper. The depositor, as will be noted from the diagram, is located near the long side of the oven, just above the conveyor bringing the empty pans back from the discharge end of the oven. Just before reaching the depositor, the pans pass over the greaser. After being flushed with pan grease to prevent sticking of the cakes to the pan during baking, the pans drain for a few feet of travel, then are filled with the desired amount of batter as they pass beneath the depositor. They continue along the conveyor belt to the feed end of the oven, pass through the oven and emerge at the discharge end where the cake is immediately dumped out of the pans then put on the conveyor which takes them back to the greaser and depositor. The pans thus flow around a closed circuit.

The pan grease is used hot, being held in a steam-jacketed kettle provided with an agitator so that separation of oil and flour does not occur.

It has been found that a better cake can be made by baking in hot pans, though this point is not usually taken advantage of in many cake plants, where from necessity or otherwise, cake is rarely baked in other than cold pans.

Cast aluminum is the preferred material for the chocolate cup cake pan. However, the design of the pan is important, too. A cup cake pan of conventional design has a top of unbroken surface, which acts to trap the oven heat and forms a dead pocket around the cup. It is much better if the flat, unbroken top surface is dispensed with altogether and the cups joined to each other with ribs. This gives a pan having no dead air pockets when set on the oven hearth, but instead permits heat to circulate freely and makes for a better baked cup cake of larger volume.

It is not the purpose of the writer at this time to go into the subject of icings for the chocolate cup cake. The preparation of an icing which will maintain its freshness and eating quality for the required eight days of the cake's salable life requires as much technological "know-how" as goes into the actual baking of the cake.

From production management's side, the successful large-scale baking of a cake like the 5-cent chocolate cup involves other factors not specifically mentioned above.

These factors include an efficiently engineered set-up to handle the purely mechanical operations of taking flour, sugar, shortening and the like, and then converting these materials into the final iced and wrapped package of cup cakes.

Likewise, essential in the profitable production of the 5-cent cake are complete and accurate cost figures, continually kept up to date.

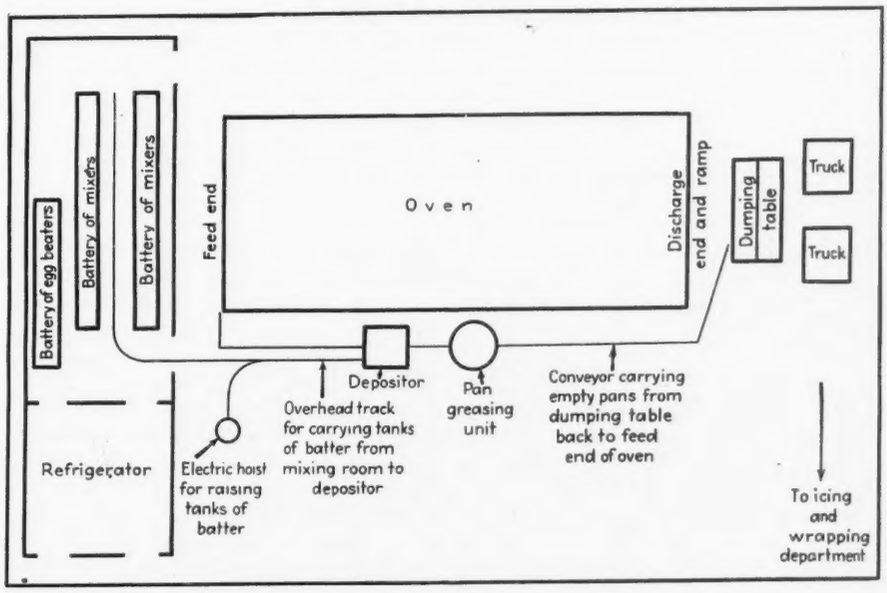


Diagram of a mixing and baking layout for the production of chocolate cup cakes, illustrating one approach to the engineering problems involved.

Bulk Storage and Blending Aid Price, Quality Control

By EDGAR S. MILLER, Minneapolis, Minn.

PART II—Flour mills with a bulk storage capacity which permits analysis and blending find it easier to meet their customers' specifications. But the storage bins must be properly constructed and the materials handling equipment correctly designed

A MILL with adequate bulk flour storage space intelligently designed enjoys many advantages. The chief advantage is the ability to maintain uniformity in the products shipped out. This advantage extends to the purchaser, particularly if he is the operator of a commercial bakery in which maintenance of a close schedule of operations if profitable.

Baking technologists place a very high value upon what is termed "the handling properties" of flour. It is obvious that to be satisfactory a flour must have those properties, not now and then, but continually, hour after hour and day after day. Bakery chemists do not hesitate to say that without uniformity there can be no satisfactory quality; that a flour which is ostensibly better than specifications may be a source of heavy loss to the baker when it does not fit in with his scheduled procedure.

With properly arranged bins for blending and storing flour, the characteristics of the contents of each bin can be ascertained before blending and packing off begins, and the amount to be drawn from each bin can be determined with considerable accuracy. Relatively small bins to receive the flour as it is milled are favored, and division of them into three groups is advantageous. The smallest group, preferably consisting of three bins large enough to hold three days' run, will be alloted to "2nd clear." The next larger group will be for "1st clear", with the largest for "patent." As suggested in Part I, making of "longer" flours than mill-stream patent by incorporating with this patent the required percentage of "1st clear" or "2nd clear" is considered good practice. In that way the "clears" packed off as such will always be of approximately the same percentage. But if a "75 percent patent" is made by cutting in some of the purer streams normally going to "1st clear," this "clear" will be of an entirely different nature than otherwise. It would then be possible to make so many different kinds of "1st clear," each with different characteristics, that difficulty might be

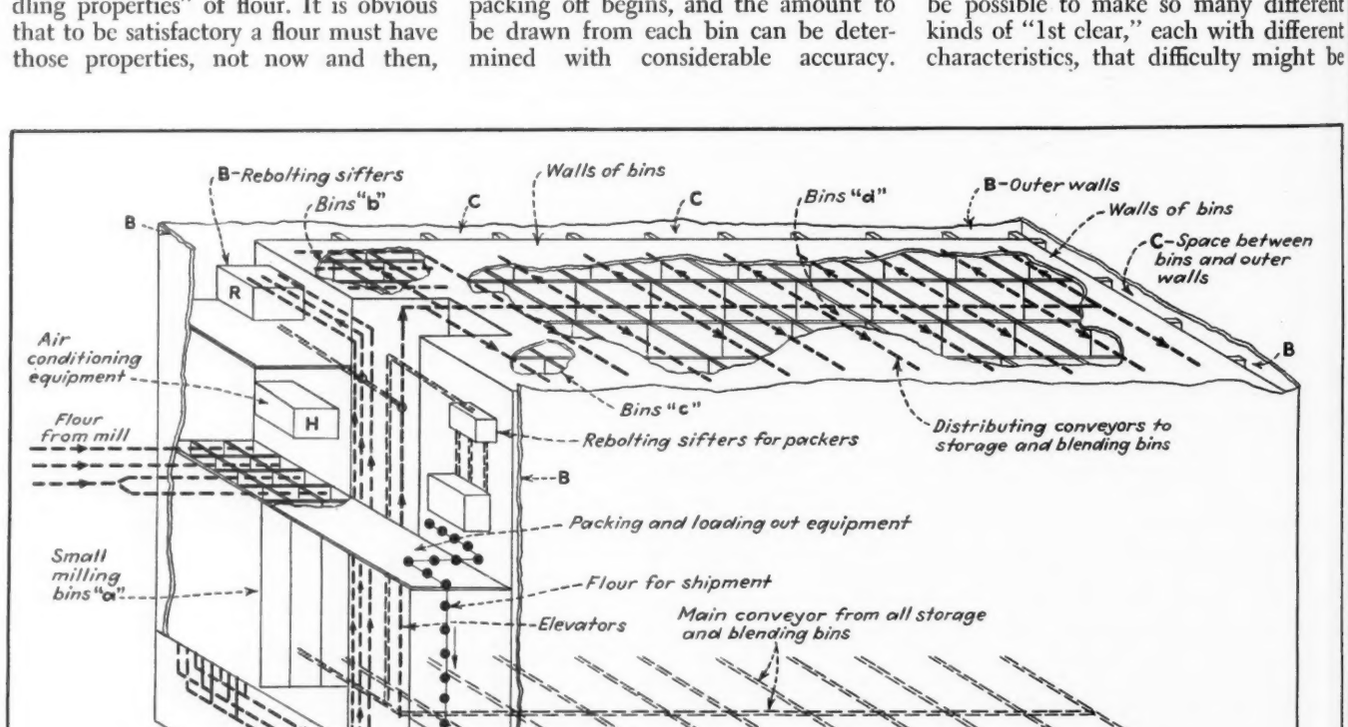


FIG. 3. Schematic diagram of bins for bulk flour storage.

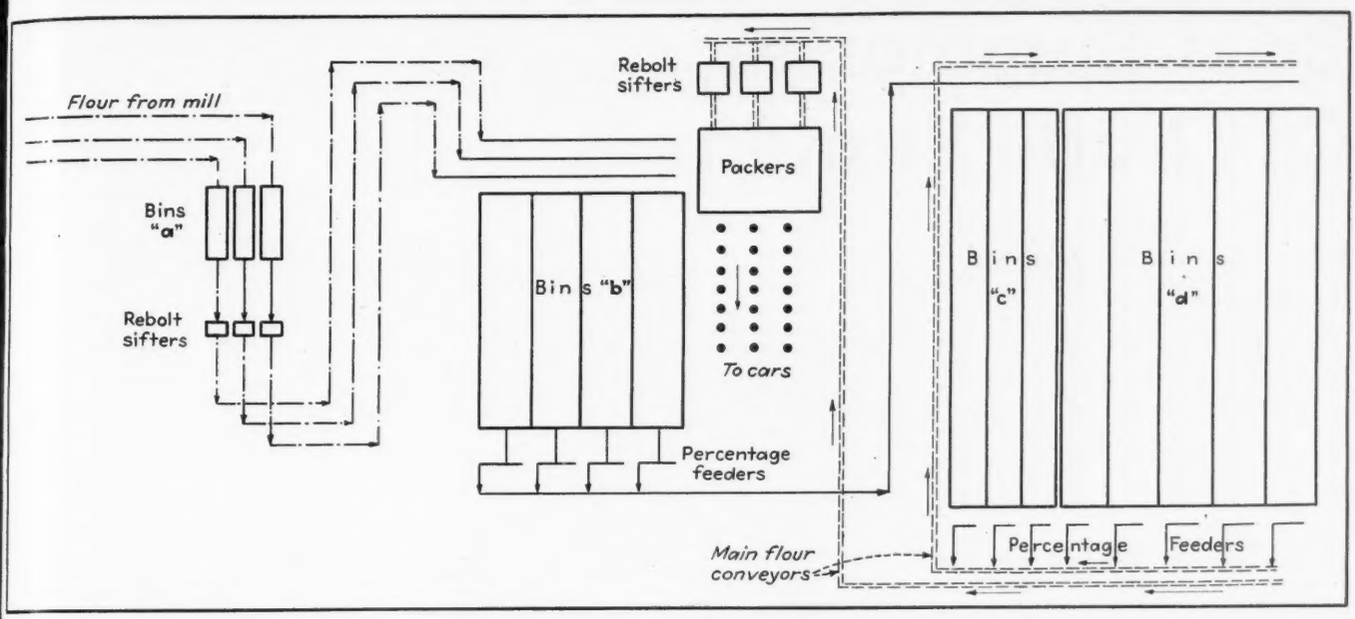


FIG. 3a. Flow diagram for movement of flour into and out of storage bins shown in Fig. 3.

found in keeping track of all them, even with an abundance of bulk storage.

Unquestionably, virtually all flour entering commercial trade channels today has been treated for the purpose of "aging" it. This is not merely a matter of bleaching because in addition to color removal, many changes are brought about in the gluten proteins and, perhaps, in enzymic activity. This is not the place to discuss such treatment, but it is of interest to the subject under consideration that certain users look upon recently milled flours with disfavor, even when treated by an approved process. There is evidence that activities set in motion by "bleaching" or "maturing" agents continue for some time after treatment. Apparently a general belief exists that a condition of reasonable stability is attained only after a period of about 30 days. Bulk storage sufficient to permit the holding up of all flour for at least three weeks before shipment should be advantageous from this angle, in addition to the several other advantages previously mentioned.

The Condensation Problem

Considerable trouble has been experienced with some of the large bulk storage installations made in recent years, and there can be little doubt that much of the trouble was due to failure to give full consideration to the known laws concerned with thermohygrics' the science dealing with changes of heat and moisture in air. Although in most cases the planners realized that a condensation problem existed, since freshly milled flour is fairly warm and the air with the same temperature carried in the interstices is not far from the moisture-saturation point, a great deal of dependence seems to have been placed upon insulation. That well-insulated walls retard the passage of heat from the flour and its contained air to the space around the bins is true. But retardation is not enough when storage extends over any considerable period of time and the temperature of the outer surfaces of the walls goes much below that of the contents of the bins.

Storage bins whose outer walls were protected against outdoor temperatures only by insulation in the form of hollow tile or other efficient insulating material generally have not proved successful. On the other hand, where bins have been erected within heated rooms and at some distance from the building walls, steel has been found practically as satisfactory as any other material. The main thing to keep in mind is that heat will pass through any wall if the temperature differential is sufficient, although the passage may be very slow. So if the air mixed with the flour loses heat without losing moisture, there is likely to come a time when the water vapor can no longer exist as vapor, having lost a portion of its latent heat. Condensation upon the inner walls is then certain. And whenever flour and liquid water come in contact, satisfactory storage conditions vanish.

Much has been said upon occasion about "free water" and "bound water" in grains and the products derived from the milling of grains, but agreement as to just what is meant seems to be lacking. Yet it is important that the physical aspects of the matter be sufficiently well understood to make accurate predictions concerning what will occur in practice in different environments likely to be encountered. For this purpose the liquid water so strongly adsorbed on minute particles that it is able to resist vaporization at the prevailing temperature may be considered "bound." If any part of it is vaporized because of the absorption of additional heat, it is not bound as a vapor. And having been released from the binding of adsorption, and having vacated its former position, it does not necessarily become immediately bound again when it assumes liquid form because of a loss of heat.

Condensation on the inner walls of bins containing flour consists of infinitesimal droplets of liquid water. When these come in contact with small flour particles whose power to absorb all of them firmly is inadequate, a thin film composed of flour and water adheres to the walls. However smooth the wall surfaces may be, adhesion will occur. The flour particles, as well as the water with which they are mixed, are then firmly adsorbed on the wall; the surface is no longer smooth. Movement of the unbound particles of flour is impeded, and the contents of the bin will not draw down satisfactorily.

Stratum upon stratum is affected by this altered coefficient of friction, even though only the first few actually may be wetted. And because flour is at best not very free flowing, "bridging" which effectually prevents the removal of the bin's contents frequently occurs. The conditions responsible for the situation are, of course, conducive to chemical changes which make matters worse and worse. And the train of circumstances, once set in motion, is almost certain to result in heavy losses through actual spoilage of the flour.

(*Turn to page* 113)

Brief Summaries Of Grade Standards

For the convenience of those who control quality in the food industries the following digest has been prepared of a standard issued by the Agricultural Marketing Administration

ABSTRACTS containing the principal requirements of the standards issued by the Agricultural Marketing Administration of the Department of Agriculture are prepared by FOOD INDUSTRIES. The following standard and those which appeared in previous issues are a continuation of the series begun in 1940.

The complete text of the standard can be obtained from the Agricultural Marketing Administration, located in Washington, D. C.

Canned Grapefruit (FINAL)

U. S. GRADE A or U. S. FANCY canned grapefruit has a drained weight of not less than 60 percent of the capacity of the container; consists of not less than 75 percent by weight of whole or almost whole segments; possesses a practically uniform, bright, typical color; is practically free from defects; possesses a firm, fleshy character of fruit; possesses a normal canned grapefruit flavor; and scores not less than 90 points when scored in accordance with the official scoring system.

U. S. GRADE B or U. S. CHOICE canned grapefruit has a drained weight of not less than 55 percent of the capacity of the container; consists of not less than 50 percent by weight of whole or almost whole segments; possesses a reasonably uniform, typical color; is reasonably free from defects; possesses a reasonably firm and fleshy character of fruit; possesses a normal canned grapefruit flavor; and scores not less than 75 points when scored in accordance with the official scoring system. U. S. Broken canned grapefruit meets the requirements of the U. S. GRADE B or U. S. CHOICE except that it consists of less than 50 percent by weight of whole or almost whole segments, and may score not less than 60 points when scored in accordance with the official scoring system.

OFF-GRADE canned grapefruit is canned grapefruit that fails to meet the requirements of the foregoing grades.

Packing Sirup—Canned grapefruit is usually packed in sirup. Sirup "cut-out" requirements, however, are not incorporated in the grades of the finished product. Canned grapefruit will be certified as to grade without regard to sirup density, but in each instance Federal inspection certificates will indicate the density of sirup found upon examination. When samples are officially drawn, the designation of sirup will be based upon the average sirup density of all containers examined, provided the range of variability is within the limits of good packing practice. For this purpose, "Heavy sirup" or "Heavy grapefruit juice sirup" means that the sirup tests 18 deg. or over, Brix. "Light sirup" or "Light grapefruit juice sirup" means that the sirup tests 16 to 18 deg. Brix. "Water, slightly sweetened" or "Grapefruit juice slightly sweetened" means that the sirup tests less than 16 deg. Brix. "Water pack" means that the product is packed in water. "Juice pack" means that the product is packed in natural grapefruit juice.

Drained weight—Drained weight of canned grapefruit is determined by emptying the contents upon a circular sieve of proper diameter containing 8 meshes to the inch (0.097-in. perforations) and allowing to drain for two minutes. A sieve 8 in. in diameter is used for No. 2½ size cans and smaller, and a sieve 12 in. in diameter is used for cans larger than No. 2½ size. "Capacity of the container" means the weight of distilled water at 68 deg. F. which the sealed container will hold.

If the drained weight is 60 percent or more of the capacity of the container, a score of 18 to 20 points may be given. If the drained weight is 55 to 60 percent of the capacity of the container, a score of 15 to 17 points may be given. Grapefruit that falls into this classification shall not be graded above U. S. GRADE B or U. S. CHOICE, regardless of the total score for the product.

Grapefruit that fails to meet the requirements of the above paragraph may be given a score of 0 to 14 points and shall not be graded above OFF-GRADE, regardless of the total score for the product.

Wholeness—"Whole" segments are segments that have retained their apparent original conformation, that are not excessively trimmed and that weigh not less than ¼ oz. "Almost whole" segments are portions of segments that are not less than 75 percent of the apparent original segment size, that are not excessively trimmed, and that weigh not less than ¼ oz. "Broken" segments are portions of segments that are less than 75 percent of the apparent original segment size, or segments or portions of segments that weight less than ¼ oz. Segments or portions of segments that are excessively trimmed or portions of segments that are joined together by a "thread" or membrane are considered broken.

If 75 percent or more by weight of the drained grapefruit consists of whole or almost whole segments, a score of 18 to 20 points may be given. If from 50 percent to 75 percent by weight of the drained grapefruit consists of whole or almost whole segments, a score of 15 to 17 points may be given. Grapefruit that falls into this classification shall not be graded above U. S. GRADE B or U. S. CHOICE. If less than 50 percent by weight of the drained grapefruit consists of whole or almost whole segments, a score of 0 to 14 points may be given. Grapefruit that falls into this classification shall not be graded above U. S. BROKEN.

Color—Federal inspection certificates will designate pink grapefruit when it can be determined that the product was prepared from pink varieties of fruit.

To receive a score of 18 to 20 points the grapefruit must possess a practically uniform, bright, typical color. "Practically uniform, bright, typical color" means that the typical color may be slightly variable, but light and free from any noticeable tinge of amber color.

If the grapefruit possesses a reasonably uniform, typical color, a score of 15 to 17 points may be given. Grapefruit that falls into this classification shall not be graded above U. S. GRADE B or U. S. CHOICE.

Grapefruit that fails to meet the requirements of the paragraph above, or is definitely off color for any reason, may be given a score of 0 to 14 points and shall not be graded above OFF-GRADE.

Absence of Defects—The factor of absence of defects refers to the degree of freedom from seeds, portions of membrane and units which are otherwise damaged by pathological injury, lye peeling damage, or other defects. Grapefruit that is practically free from defects may be given a score of 19 to 20 points. "Practically free from defects" means that for each 20 oz. of net contents there may be present not more than one large seed or four undeveloped seeds and that the aggregate area covered by membrane does not exceed one square inch; and that not more than 5 percent by weight may be otherwise damaged.

If the grapefruit is reasonably free from defects, a score of 15 to 17 points may be given. Grapefruit that falls into this classification shall not be graded above U. S. GRADE B or U. S. CHOICE.

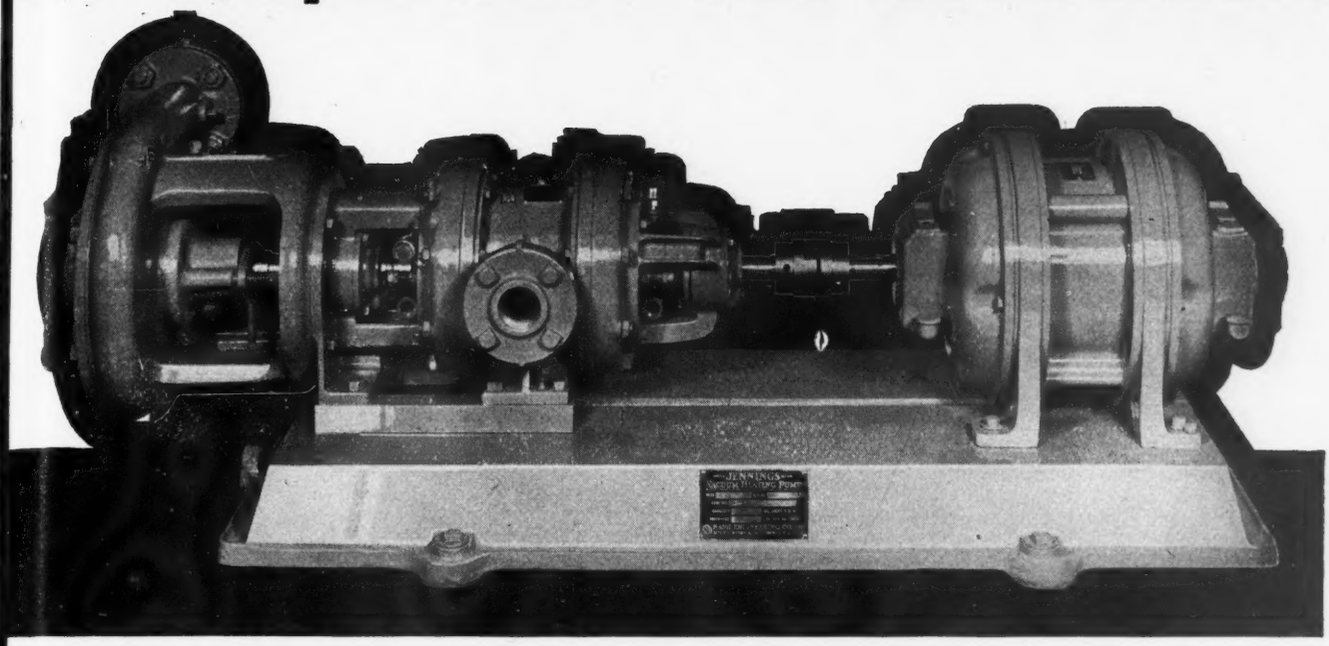
Grapefruit that fails to meet the requirements of the paragraph above may be given a score of 0 to 14 points and shall not be graded above OFF-GRADE.

Character of Fruit—The factor of character of fruit refers to the structure and condition of the cells and reflects the maturity of the fruit. To receive a score of 18 to 20 points the grapefruit must possess a firm, fleshy character, with very few floating free cells present and the segments firm with well-developed, juicy, cellular structure.

If the grapefruit possesses a reasonably firm and reasonably fleshy character of fruit, a score of 15 to 17 points may be given. Grapefruit that falls into this classification shall not be graded above U. S. GRADE B or U. S. CHOICE.

Grapefruit that is definitely of very poor character for any reason may be given a score of 0 to 14 points and shall not be graded above OFF-GRADE.

Nash—the Perfected Vacuum Pump for Evaporators and Condensers

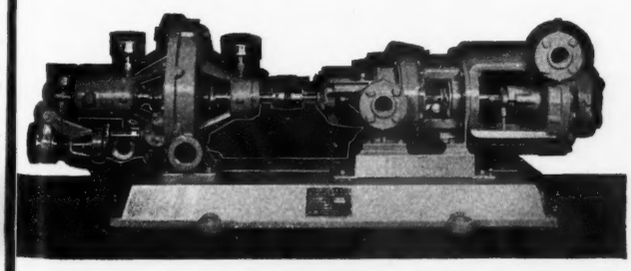


COMBINATION VACUUM REMOVAL UNIT ESPECIALLY DESIGNED FOR SATISFACTORY OPERATION ON CONDENSERS WITHOUT BAROMETRIC LEG

Especially designed for drawing air and liquid from high vacuums, the Nash Vacuum Removal Unit is an efficient combination of a standard Nash Vacuum Pump and a Jennings Centrifugal. This design may be had in either motor or steam turbine drive, and may be installed with confidence that it will operate perfectly.

Nash Vacuum Pumps for Evaporator and Condenser Service offer unusual advantages. Vacuum is non-pulsating, producing uniform operating conditions and assuring a better product. Nash Vacuum Pumps have no valves, gears, pistons, rings, or mechanical complications. The single moving element rotates without metallic contact, and no internal lubrication is required. In standard design these pumps maintain vacuums up to 27" of mercury.

Nash Pumps are compact, and require but a fraction of the space taken by old type equipment. They may be installed where convenient, and they operate at suitable speeds for direct connection to either electric motors or steam turbines. Nash engineers will be glad to recommend proper equipment to exactly meet your particular requirements.

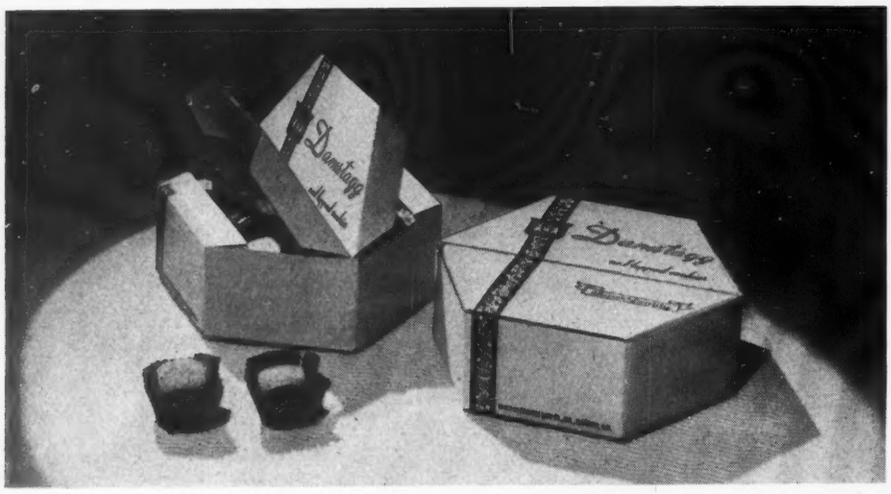


THE NASH VACUUM REMOVAL UNIT MAY BE HAD EQUIPPED WITH STEAM TURBINE DRIVE WHERE THIS TYPE IS PREFERRED

NASH ENGINEERING COMPANY

SOUTH NORWALK · CONNECTICUT, U. S. A.

NEW PACKAGES & PRODUCTS



Corrugated Cookie Box

MANY packaging innovations originally developed to relieve shortages of critical materials may be retained as permanent improvements after the war. An example of a successful change is the 3-lb. corrugated cookie box designed by Hinde & Dauch Paper Co. for the Sterling Cake Co., Inc., Brooklyn, N. Y. This cake company formerly packed its cookies in a tin container.

Of sturdy die-cut construction, the attractive hexagon-shape package is some 75 percent lower in original cost than the tin container formerly used. In addition, it is 33⅓ percent lighter in weight, and is shipped flat. The corrugated board insures minimum breakage.

A center-hinged lid raises to reveal the cookie assortment in two separate compartments. While widespread adoption of this type of container is now limited by demand for corrugated shipping boxes, cost advantages are so substantial that the package may come into general use after the war.

Keeps Product Identity

COFFEE converted from tin to glass pack, paper bags and cartons is a familiar sight on grocery shelves—while it stays on the shelves. Eppens Smith Co., New York, is packing its product, Holland House Coffee, in a paperboard container designed by Robert Gair Co. The former tin container used cream, brown and black for reproduction, but product identity is satisfactorily maintained on the carton by the use of two colors—cream and brown.

Wheat-Germ Cereal

AIMING at renewed public interest in wheat products and cooked cereals, New Richmond, Wis., is introducing on a national basis "New Rich Rolled Wheat." Natural wheat germ, bran and other nutritional elements are retained in the quick-cooking cereal.

Retention of nutritive elements and product protection is assured by packing Rolled Wheat in a special hermetically sealed inner bag, within a colorful, 22-oz. outer carton. Interest in wheat products has greatly increased as a result of publicity being given to surplus wheat stores held in the country.

Rumford Can Changed

RUMFORD (R. I.) Chemical Works has made a change in its familiar red, black and white container of Rumford Baking Powder. Formerly packed in tin, the baking powder is now marketed in a chipboard can with blackplate ends, and a tinplate friction cap which slips over a rim around the opening in the blackplate top. A new informative label gives the amount of phosphorous and calcium contained in the baking powder.

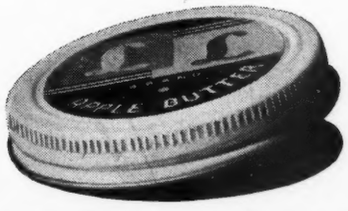
Dehydrated Bortsch

ONE of the foremost packers of dehydrated foods, Dry Pack Corp., New York, is now processing and packing bortsch, the Russian soup, in dehydrated form. The dry soup mix contains beets, cabbage, onions, powdered milk, cornstarch, granulated beef extract, salt and spices, and is similar in flavor to the Russian product. An easily prepared soup, it may be garnished with a tablespoon of sour cream or a slice of lemon.

When Advertising Scored

NATIONALLY distributed and nationally advertised, "Tenderoni," product of Van Camp's Inc., Indianapolis, is a comparative newcomer in the macaroni

standardized glass . . . but STAND-OUT PACKAGES



WARTIME glass package design restrictions mean that now, more than ever, your containers need every bit of distinction you can give them. And lithographed Armstrong's Metal Caps can give them that individuality—economically, colorfully, promptly, and safely.

These brightly-colored, sure-sealing closures help your packages tell your sales story, help them stand out from the others in retailers' displays. Remember, too, that lithographed caps keep re-selling your name or trade-mark every time the consumer re-opens your package. More sales result from this repetition.

If you want to change your standardized glass containers into stand-out packages, write today for cap design suggestions. There's no obligation. You'll also receive the details of Armstrong's top-quality glass containers for foods. Armstrong Cork Company, Glass and Closure Division, 4203 Jackson Street, Lancaster, Pennsylvania.

★ ★ ★

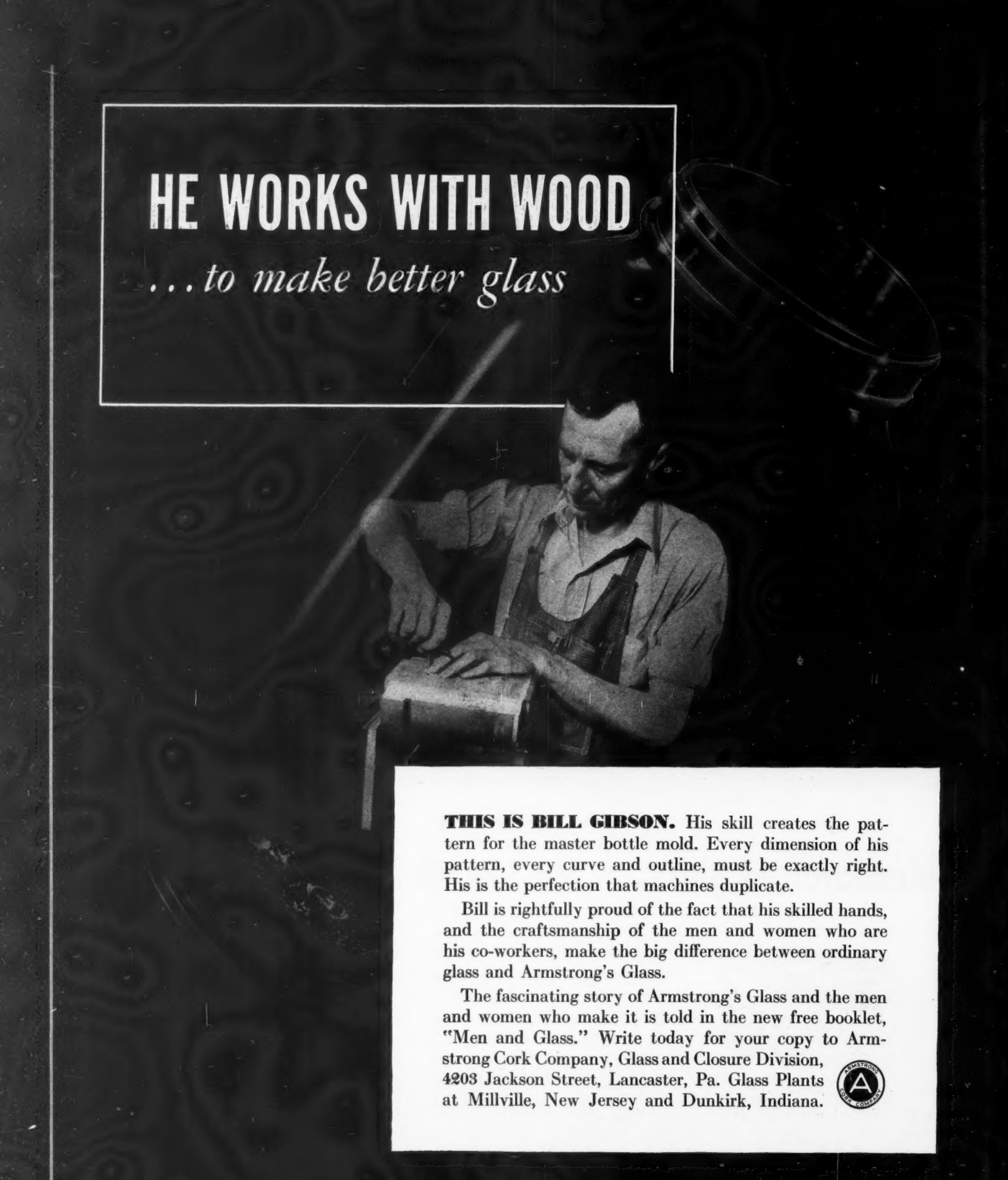
The Army-Navy "E" has been awarded to the men and women of Armstrong's Closure and Floor Division Plants for excellence in production of such materials as cartridge cases, shells, bombs, camouflage, etc.

Armstrong's Closures

TURN STANDARD CONTAINERS (A) INTO STAND-OUT PACKAGES

HE WORKS WITH WOOD

. . . to make better glass



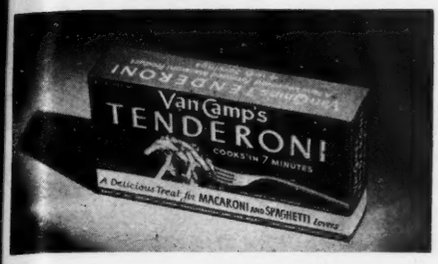
THIS IS BILL GIBSON. His skill creates the pattern for the master bottle mold. Every dimension of his pattern, every curve and outline, must be exactly right. His is the perfection that machines duplicate.

Bill is rightfully proud of the fact that his skilled hands, and the craftsmanship of the men and women who are his co-workers, make the big difference between ordinary glass and Armstrong's Glass.

The fascinating story of Armstrong's Glass and the men and women who make it is told in the new free booklet, "Men and Glass." Write today for your copy to Armstrong Cork Company, Glass and Closure Division, 4203 Jackson Street, Lancaster, Pa. Glass Plants at Millville, New Jersey and Dunkirk, Indiana.

ARMSTRONG'S GLASS

and **ARMSTRONG'S CLOSURES**



and spaghetti field. Although this new macaroni has only been on the market a short time, it has become a familiar item in the grocery trade.

Van Camp's purchased the name "Tenderoni," a plant for production and designed the new package in April, 1942; by January of this year the brand name had become a household word. Tenderoni contains durum wheat semolina and egg white, is free from artificial color, and cooks in 7 minutes.

Introducing "Bruceets"

NEED for compressed foods and consequent saving of tin, plus the Army demand for easily prepared food, has resulted in a new product, "Bruceets," developed by Prime Products, Inc., Tampa, Fla. These products are essentially the undiluted juice of fruits and vegetables in the form of a hard, rectangular, candy-like tablet. No sugar or other substance is added to the juice, and the unique physical properties of the juice are due to the processing methods used. Bruceets can be eaten without preparation, and contain all the soluble constituents of the original foods.

After a method of processing was developed, Prime Products expanded technical and research facilities, applying the process successfully to many products, including oranges, grapefruit, carrots, apples, pineapples, tomatoes, celery, beets, turnips, cabbage, apricots and prunes. The company reports that the mineral constituents of Bruceets appear in the same proportions as in the original foods, and the vitamins suffer negligible losses.

The new process can be carried out with equipment now in existence, but idle because of shortages in packaging or other critical materials.

Meal for Meatless Days

"SIMPLE Simon Victory Dinner," despite its nursery-rhyme connotations, is a hearty, full-flavored dish for adults, containing 6 oz. of semolina spaghetti,

1 oz. of Argentine Parmesan cheese and ½ oz. of dehydrated vegetables. Marketed by Simple Simon Foods, Detroit, Mich., the product is prepared in 7 minutes to provide servings for four.

On the Simple Simon Victory Dinner package are directions for 10 other dishes that can be made from the product, utilizing left-over meats and sauces.

an integrated
PACKAGING
service

Your nearest Rossotti Packaging Man will consider it a privilege to demonstrate how the Rossotti organization can equip your products—or group of products – with it's most salable dress. Or write us at North Bergen direct for constructive, hard-hitting packaging counsel. No obligation, of course.

Rossotti
LITHOGRAPHING COMPANY, INC.
NORTH BERGEN, N. J.
SALES OFFICES IN PRINCIPAL CITIES

SOVFOTO

. . . "Cvinya Tushunka" to you! And it's packed in Crown Cans

It's not likely that "Cvinya Tushunka" will ever be in much demand on the American market.

But the Russian Army likes it, and judging by present results, it must be a first class fighting diet.

"Cvinya Tushunka" is a mouthful of a name . . . but American packing plants are filling orders for millions of pounds of this Russian Army favorite . . . a combination of pork, onions, lard, pepper, salt, and one bay leaf to the can.

And Crown Can is supplying containers . . . just under a pound in size . . . which carry this fighting food to the Russian front. One more way in which Crown facilities and Crown workers are helping win the war on the production front!

CROWN CAN COMPANY
Philadelphia • New York

CROWN CAN

FOOD INDUSTRY NEWS

GENERAL NEWS • TRENDS • MEN • JOBS • COMPANIES • MARCH, 1943

USDA Revamped By Wickard

Food Distribution and Production administrations have almost completed new setup

REORGANIZATION of the Department of Agriculture on the lines laid down in the Executive order setting up the Food Administration is about complete. Transfer of personnel from the War Production Board took place early in January and at the same time the Department policy on the employment of dollar-a-year men was stated again. Forty-three individuals in the dollar-a-year class were among the approximately 350 that were transferred, and almost without exception they are no longer in Washington.

Simultaneously the organization of the Food Distribution Administration was announced. Serving under Director Roy F. Hendrickson are deputy directors C. W. Kitchen, Major Ralph W. Olmstead, J. S. Russell and E. A. Meyer. Other members of the staff of the director are: Arthur C. Bartlett, special assistant; Budd Holt, economic advisor, and Norman Gold, E. O. Mather, S. R. Newell, Otie M. Reed, Jacob Rosenthal, and John C. Canning, special assignments.

Nine commodity branches functioning under the direction of Mr. Kitchen and their chiefs are: Fruit and vegetable branch, W. G. Meal; Fats and Oils branch, T. L. Daniels; Dairy and Poultry branch; T. G. Stitts; Grain Products branch, E. J. Murphy; Livestock and Meats branch, Harry E. Reed; Special Commodities branch, H. C. Albin; Sugar branch, Joshua Bernhardt; Tobacco branch, Charles E. Gage; Cotton and Fiber branch, C. E. Robinson.

Three branches dealing with the problems of civilian food requirements and programs are under the direction of Mr. Russell. These are Civilian Requirements branch headed by Dr. Russell M. Wilder, Civilian Programs branch for which C. F. Kunkel is acting chief, and the Food Conservation branch for which no chief had been appointed by mid-February.

Under the direction of Major Olmstead are the Transportation and warehousing branch, the Program Analysis and Appraisal branch, the Program Liaison division, the Compliance branch and six administrative service divisions.

Under the direction of Mr. Meyer, who was formerly assistant chief of the Food Division of WPB, are four branches. Problems of plant conversion, new processes, new containers, and the distribution of materials and equipment within the food distribution field are being handled by the Facilities branch under J. B. Wycoff, chief. No announcement has been made naming a chief for the Processors branch which will consider the day-to-day problems of the processors. This branch works with the commodity branches in organizing, managing and servicing advisory committees of food manufacturers.

The appointment of M. Clifford Townsend to succeed Herbert W. Parisius as chief of the Food Production Administration caused a slight delay in the organization of FPA. Late in January the setup was approved with J. B. Hutson, associate director; A. G. Black, associated director; D. A. Fitzgerald, deputy director.

Order Equipment Now

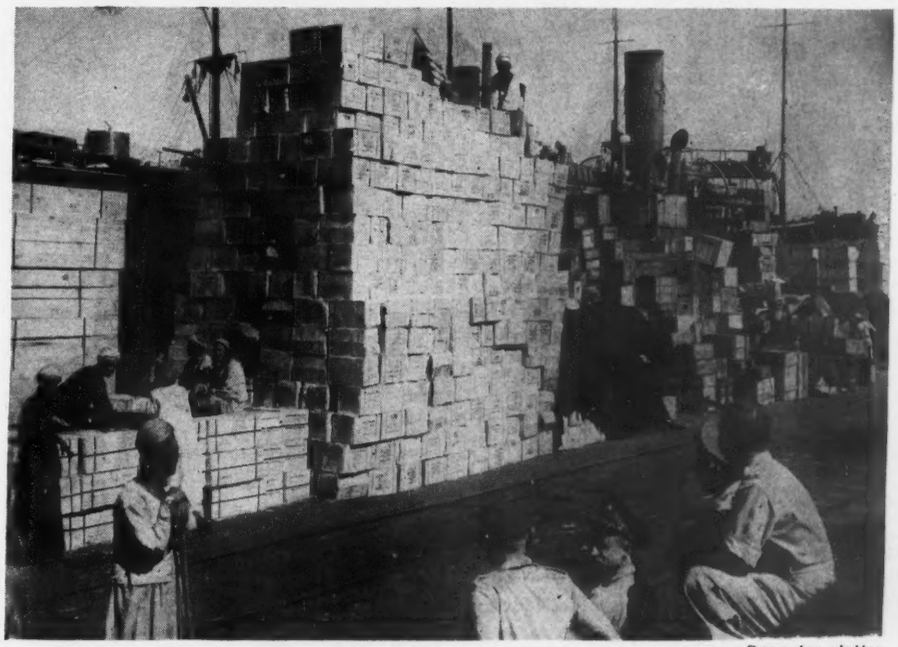
FOOD PROCESSORS were advised by Secretary of Agriculture Wickard on February 8 to place orders now for equipment needed for approved new plant facilities. The Secretary also urged immediate action to keep supplies of maintenance and repair parts at a normal level.

New Rationing Plan in Effect

Canned and frozen fruits and vegetables and dried fruits included. More to follow

WHILE it is yet too early to estimate the success of the new rationing program which began March 1, the administration of the order will set the pattern for point rationing of other commodities, with meat products and butter scheduled to come under the program in the near future. At present, the program includes canned fruits, vegetables, juices and soups, frozen fruits and vegetables and dried fruits. But consumer rationing of all fruits, fruit juices, vegetables, vegetable juices, soups and baby foods has been authorized, and rationing of fish, shellfish, jams, jellies, preserves, fruit butters, pickles and relishes and canned milk has been requested by the Department of Agriculture. It is assumed that rationing of these products would allow a "freeze" period similar to the period recently allowed grocers.

Rationing of all edible meat products —beef, veal, lamb, mutton, and pork,— canned baby foods and butter is now under study in the OPA.



Press Association

AMERICAN FOOD IN MIDDLE EAST

Huge pile of colored margarine from food factories of the United States is stacked on a dock somewhere in the Middle East. The small stack at lower left is ale from Montreal. The ship in the background flies a Greek flag, visible over the big pile of margarine.

Joint Research Program Set Up

Army, Navy combine food research under Auchter; two consulting committees appointed

BASIC food research needed by the Quartermaster Corps of the Army and the Bureau of Supplies and Accounts of the Navy will be integrated in a program conducted by the Agricultural Research Administration. The new arrangements, outcome of conferences recently held by Rear Admiral W. J. Carter and Colonel G. F. Doriot with Agricultural Research Administrator E. C. Auchter, will thus correlate in one unit the food and nutrition research for the armed forces, as well as for civilians. Two consulting committees, one consisting of experts on nutrition and the other of research personnel representing the food processing industry, have been appointed to cooperate with Dr. Auchter on food research problems.

The committee on nutrition includes:

Dr. Vincent DuVigneaud, head of the chemistry department, Cornell University, Ithaca, N. Y.; Dr. W. C. Rose, University of Illinois, Urbana, Ill.; Dr. Icie Macy Hoobler, Children's Fund of Michigan, Detroit, Mich.; Dr. W. H. Sebrell, U. S. Public Health Service, Bethesda, Md.; Dr. C. A. Elvehjem, professor of biochemistry, University of Wisconsin, Madison, Wis.; Dr. L. A. Maynard, director of the School of Nutrition, Cornell University, Ithaca, N. Y.; Dr. George R. Cowgill, associate professor of physiological chemistry, Yale University School of Medicine, New Haven, Conn.; Dr. Tom D. Spies, Hillman Hospital, Birmingham, Ala., and Dr. E. V. McCollum, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

The consulting committee of food processors includes:

Dr. E. J. Cameron, director, research laboratories, National Canners' Association, Washington, D. C.; Dr. Norman F. Kennedy, technical director, Corn Industries Research Foundation, New York, N. Y.; Lawrence S. Martin, secretary, National Association of Frozen Food Packers, Washington, D. C.; Dr. H. R. Kraybill, director of research, American Meat Institute, Chicago, Ill.; Dr. Paul F. Sharp, research laboratories, Golden State Co. Ltd., San Francisco, Calif.; W. L. Walde, director, National Preservers Association, Washington, D. C.; Dr. O. H. Alderks, research laboratories, Procter and Gamble Co., Ivorydale, Ohio; Dr. Russell S. McBride, consultant in food research, Washington, D. C., Dr. C. G. King, scientific director, Nutrition Foundation, New York, N. Y., and Dr. C. H. Bailey, University of Minnesota, dean and director, Agricultural Experiment Station, Minneapolis; R. V. Tobin, Beech-Nut Packing Co., Rochester, N. Y.

Meat Inspection Shifted

FOR YEARS a part of the Bureau of Animal Industry, the meat inspection division of the Department of Agriculture, has been transferred to the livestock and meats branch of the Food Distribution Administration. Made on February 9 by Secretary Wickard, this transfer puts meat inspection in the agency now performing the marketing and distribution functions of the Department.

Acme Photo

U. S. TEACHES MEXICANS TO MAKE CHEESE

To advance the industrialization of Mexico, many promising young Mexicans are to receive technical training in the factories of the United States. This is part of the Inter-American Trade Scholarship program. In the food industries training will be given in sugar refining, vitamin production, cheese making and vegetable oil processing. The picture shows young Mexicans learning the art of cheese manufacture in an American plant. At the conclusion of his course, the trainee is placed with a U. S. firm for one or two years and will receive compensation while working.

Discuss Wartime Pickle Problems

Packers review their positions; learn about vegetable brining and migratory labor

IN commemorating its 50 years of continuous activity, National Pickle Packers Association opened its 1943 annual meeting with an anniversary dinner on January 19 at the Palmer House, Chicago, Ill. In attendance were more than 150 members of the industry.

Wartime problems of the industry were discussed at the meeting. President F. Olney Brown assured the members present that cucumber pickles were not on the nonessential food list, as was erroneously reported; that the armed forces were continuing to take large percentages of the 1942 crop, with plans under way for larger quantities from the 1943 pack; and that during 1943 pickles may be packed under the M-104 closure order to the amount of 100 percent of the 1942 pack, with tin to be allocated for export of government purchases as during 1942.

Salt stock on hand January 1 was reported by 43 members to be 3,117,117 bu., with genuine dills stock at 54,651 bu. On the basis of acreage represented these stocks indicate a total industry inventory of 6,442,986 bu. of salt stock and 112,962 bu. of genuine dills, to give an inventory of 6,555,948 bu. for both classes of stock as compared with a 6,234,564-bu. total inventory on January 1, 1942. Shrinkage of inventory since October 1, 1942, indicates an average monthly consumption of 648,017 bu., in comparison with an average consumption of 394,477 bu. for the same three months in 1941.

Vegetables "Pickled"

Dr. F. W. Fabian, Michigan State College, and Dr. John L. Etchells, Bureau of Agricultural Chemistry and Engineering, Raleigh, N. C., reported progress of research work on cucumber pickles and preservation of vegetables by brining. As a war project on the emergency preservation of food, the North Carolina Experiment Station at Raleigh began in April, 1942, to study the possibilities of brine preservation.

The studies included dry salting, use of 20-, 40- and 60-deg. salometer brines, with and without blanching, with and without addition of vinegar and lactic acid, and at varying temperature levels. Results were evaluated on basis of flavor, color and nutritive value retention, edibility of finished product, and on concentration as means of saving space. No definite conclusions were reported on the basis of the encouraging results obtained.

HEADS PICKLE PACKERS

Lewis Sherman, president of Jewett & Sherman Co., Milwaukee, has been elected president of National Pickle Packers Association.

George Hathway, civilian adviser to the U. S. Quartermaster Procurement Division, called attention to new stenciling instructions embodied in new requests for bids and purchase contracts.

Migratory Labor

Chairman Daly of the Association's Farm Labor Committee discussed the possibility of the pickle industry sharing migratory labor with other seasonal industries. Movement of the anticipated supply of migratory labor is to be financed by the federal government, but those using the labor must guarantee that it will be employed at least 75 percent of the contracted period at a wage of at least 35 cents per hour. If such a guarantee cannot be made, the movement of this labor supply is the responsibility of those who want to use it.

The pickle packers elected these officers for 1943: President, Lewis Sherman, Jewett & Sherman Co., Milwaukee, Wis.; vice-president, John Miller, W. & W. Canning Co., Montgomery, Ala.; treasurer, C. J. Sutphen, C. J. Sutphen & Co., Chicago; and secretary, E. T. Miller, Oak Park, Ill. Both Mr. Sutphen and Mr. Miller were reelected.

Subsidizes Production Of Four Vegetables

PRODUCTION of four important canning vegetable crops—tomatoes, peas, sweet corn and snap beans—is to be subsidized by the government. Through Commodity Credit Corp., the Department of Agriculture will purchase the out-

It's an old
American Custom
—helping the other fellow out

It's mighty hard to say, "Sorry we can't supply you" — especially when one appreciates how badly the other fellow needs the equipment he's after . . . So when we went all out on armament work, we devised a plan to obtain used machines of our make for those in urgent need of additional equipment.

Our Wrapping Machine Procurement Service

We neither buy nor sell the wrapping machines procured through this service — we merely place the prospective user in touch with another manufacturer who can sell or lease him the type of machine required.

One well-known company recently secured ten machines in this way. Others have obtained from one to four machines. And the service has proved helpful not only to manufacturers producing civilian goods, but to those on war work who could not wait for us to build new machines. . . . For example, ration bars made by a well-known chocolate bar manufacturer are now being wrapped on machines formerly used by a soap manufacturer. Army K rations, made by food manufacturers, are being wrapped on machines which were bought or leased from makers of cigarettes, paper specialties, cosmetics, etc.

We believe this typifies the spirit of cooperation which obtains in American industry today. . . . For we are sure that those manufacturers who have sold or leased their machines to others have done it chiefly to "help the other fellow out" — and that, after all, is an old American custom.

If you have any wrapping machines of our make which you do not need at present, why not list them with us? Write our nearest office.

PACKAGE MACHINERY COMPANY
Springfield, Massachusetts
NEW YORK CHICAGO CLEVELAND LOS ANGELES TORONTO

PACKAGE MACHINERY COMPANY
Over a Quarter Billion Packages per day are wrapped on our Machines

put of certified processors of these vegetables at prices to be set by the department. The government will then resell the processed foods to the canners at a discount, provided the canners have paid specified minimum prices to growers.

This program will not be affected by the action of the House Appropriation Subcommittee in rejecting the plan for making incentive payments to farmers to the extent of $100 million.

Canners Protest Grade Labeling

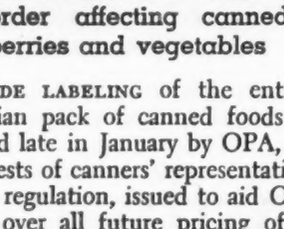
OPA asked to revise labeling order affecting canned fruits, berries and vegetables

GRADE LABELING of the entire 1943 civilian pack of canned foods was ordered late in January by OPA, over the protests of canners' representatives. The new regulation, issued to aid OPA control over all future pricing of the affected canned goods at distribution levels, is designated to supplant MPR 152 (canned vegetables) and MPR 185 (canned fruits and berries), which gave canners individual ceilings through use of a formula.

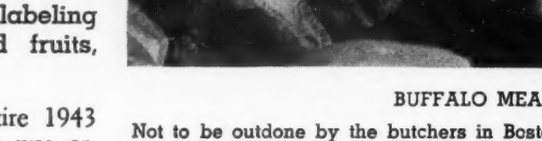
Brand names are not affected by the order, which stipulates that canned vegetables, fruits and berries shall be labeled "fancy," "choice" and "standard," or "A," "B" and "C," under the terms of the Agricultural Marketing Administration. However, canners of grapefruit juice, first product to be affected by the order, have opposed government grade labeling on the grounds of the economic and practical problems involved, and other canners are following suit. Early in January a Congressional delegation presented specific grievances to Price Administrator Prentiss M. Brown for the purpose of getting OPA to modify the grade labeling order to provide more flexible treatment.

BUFFALO MEAT SOLD IN SEATTLE

Not to be outdone by the butchers in Boston who have put horse meat on sale, a Seattle meat market recently supplied Buffalo steer meat in limited amounts to customers. This market obtained two big buffalo steers, displayed their heads over the counter and did a rushing business, while it lasted.



Trusted Ally of the Food Industries—



An army fights on its stomach. So does a navy, a city, a factory, a home.

Adequate refrigeration is absolutely essential to the nation's food supply. For nearly 60 years the food industries have considered Frick refrigeration a favorite. It helped win the last war, and is still more important in this. It's an ally you can trust.

Let us quote on that cooling system you need.

FRICK CO., Waynesboro, Penna.

TRADE FRICK MARK

Refrigeration

Pineapple, Spinach, Bean Standards Issued

TENTATIVE U. S. Standards for grades of canned pineapple, effective Feb. 1, 1943, were issued by the Food Distribution Administration. The standards serve as a convenient basis of sale in wholesale transactions and for determining loan values on stocks in storage, also forming the basis for the Federal inspection and grading service similar to that now available on fresh and canned fruits and vegetables and other processed foods.

Final standards for grades of frozen spinach, effective March 1, 1943, were recently issued. The final draft of the standards contained minor variations on the tentative standards.

On February 15 the Food Distribution Administration issued tentative grade standards for frozen snap beans, effective as of March 1.

Butter That Won't Melt

IN New Zealand, the Dairy Research Institute has developed a "butter" which will not melt at tropical temperatures. It is a mixture containing 60 percent butterfat, 20 percent beef fat and 20 percent dried milk. It will not melt at 105 deg. F.

F&DA Standards Progress Slowly

Hearing held on canned milk; one scheduled for soft cheese. Action on jellies asked

THE SCHEDULED hearing the Food and Drug Administration to determine needed modifications of the standard for sweetened condensed milk took an unexpected turn when held during the week of January 26. At those sessions it became evident that the industry really wanted two standards, one for sweetened condensed whole milk and one for sweetened condensed skim milk. The latter has become much more important than previously for many industrial users making ice cream, confectionery, and a multitude of other products. Also evident was the fact that these industrial users are now more important than housewife buyers both to milk condensers and to corn sirup makers who initiated these hearings.

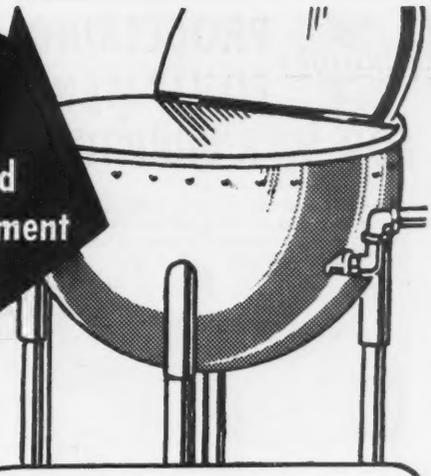
The condensed milk hearings lasted for three days and adjourned with no indication that they would need to be resumed for new further testimony. Briefs from interested parties are to be filed. Somewhat later, probably about midsummer, tentative decisions of the presiding officer are expected.

Other standards proceedings are being delayed by the shortage of manpower at F&DA headquarters. On April 6 there will open a postponed public hearing on proposed amendments for the soft cheese standards. National Preservers Association has been urging F&DA to speed up proceedings on the desired modifications of standards for jellies, jams and preserves in the manufacture of which the industry wishes to use corn sweeteners without label declaration. In view of the serious shortage of sucrose, the industry is hoping that hearings will be set and the proceedings completed in time to be of some benefit for the processing of 1943 crops.

Drive for Farm Workers To Be Organized

STEPS have been taken by the Department of Agriculture to solve the labor problem that will confront growers and canners alike at the time of harvesting and processing the crops. The plan is a program to recruit women, nonfarm youths and all other available local labor for work on the farms and in the plants during the rush season. The campaign is to be undertaken at once to assure to farmers before planting time that the necessary harvest hands will be available when needed.

REMOVE
lime-scale and rust deposits from water-cooled and steam-jacketed equipment
MORE EASILY...



Preventive Maintenance PAYS DIVIDENDS IN extending life of such units as:

- ★ kettles
- ★ dough mixers
- ★ cream beaters
- ★ candy cooling slabs
- ★ bread coolers
- ★ blanchers
- ★ steam tables
- ★ milk cooling vats
- ★ preheaters
- ★ bottle washing machines
- ★ can washing machines
- ★ heat exchangers
- ★ ammonia condensers
- ★ water-cooled compressors
- ★ etc.

Use quick-acting
OAKITE COMPOUND No. 32

Whatever steam-jacketed or water-cooled equipment you employ to process or handle foods, you can increase its operating efficiency, prolong its life by removing lime-scale and rust deposits that impair heat transfer.

But do this maintenance work with Oakite Compound No. 32. It quickly, easily, effectively dissolves insulating accumulations without harming base metal. Restores normal heating or cooling function of equipment. Saves steam, power. Widely and successfully used for descaling purposes in food and other industries, it will pay you to discover its many advantages and applications.

FREE 24-Page Manual Gives You All Details

Based on years of experience, this fact-filled manual concisely describes various uses of Oakite Compound No. 32, gives methods and formulas for de-scaling all types of processing and operating equipment. Since there is no obligation, won't you send for YOUR FREE copy today?

OAKITE PRODUCTS, INC., 26G Thames St., New York
Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE TESTED **CLEANING**
MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

UNIQUE

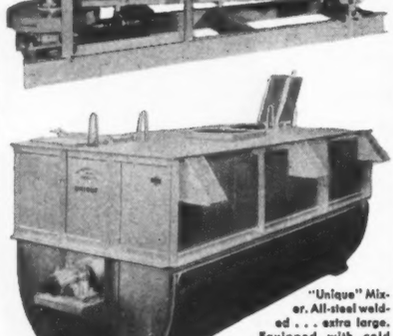
PROCESSING EQUIPMENT FOR WAR INDUSTRIES

Robinson Engineers are at your service! Avail yourself of their experience and of the facilities of our modern testing laboratory. Illustrated catalogs on request for any "Unique" equipment.

"Unique" Saw Tooth Crusher. Special grade steel saws, mounted in roller bearings. Heavy-duty balance wheel carries intermittent shock load.

"Unique" Jr. Disc Grinder. Built-in direct-drive motor. Shown equipped with jacket for hot or cold water or steam and mounted on steel base.

"Unique" Tumbling Prism Mixer. Driven by gearhead motor. For handling dry powders that cannot stand much agitation. All-steel welded frame.



"Unique" Gyro-Sifter. Motor driven. With telescopic hopper for efficient, continuous feeding of dry powders.

"Unique" Mixer. All-steel welded . . . extra large. Equipped with cold water jacket, mixing inlet and two inspection doors. Solid stainless steel construction.

Firms with war contracts have immediate priority on our complete engineering and manufacturing facilities.

ROBINSON MANUFACTURING COMPANY

WORKS: MUNCY, PA.

30 CHURCH STREET, NEW YORK

Food Administration Orders

Milk and Milk Products—Monthly use of milk and milk products in frozen dairy foods was limited to 65 percent of the quantities used for civilian consumption in the corresponding month during the base period, Dec. 1, 1941, to Nov. 30, 1942, in Food Distribution Order No. 8, issued Feb. 1.

Peanut Oil Production—Distribution Order No. 14, issued Feb. 6, reserved 25 percent of the peanut oil production at the point of refining to assure adequate quantities for essential war uses.

Cheddar Cheese—The Food Administration on Feb. 8 issued Distribution Order No. 15, setting aside half the monthly production of cheddar cheese for direct war production. The regulation applies to every person producing more than 8,000 lb. of cheddar cheese in any calendar month between January, 1942, and January, 1943, or a person who produces more than 8,000 lb. of cheese during February, 1943, or any subsequent month.

Dried Fruit—Food Distribution Order No. 16, issued Jan. 30, places restrictions on the purchase, delivery and use of dried fruit, requiring any packer to set aside for government use the dried fruit, or fresh fruit acquired for the production of dried fruit, which were in his possession on Aug. 10, 1942, or acquired by him one year thereafter. If the dried fruit set aside is not required by the government, the Director may release the fruits by notice to the packer.

Canned Fish—Under Food Distribution Order No. 23, issued Feb. 19, salmon canners are permitted to sell to wholesalers the remaining 20 percent, about 50,000,000 lb., of their 1942 pack. The order establishes each canner's quota percentage as 80 percent by net weight of his pack of pilchard, sea herring and mackerel, and 60 percent of his pack of salmon for government agencies.

Canned Fruits and Vegetables—Food Distribution Order No. 24, issued Feb. 22, prevents canners from delivering any restricted canned foods to a wholesale receiver except in accordance with government regulations concerning three groups of fruits, vegetables and fruit and vegetable juices. A wholesale receiver with less than 25 percent of the restricted foods in his possession may accept delivery to fill his quota.

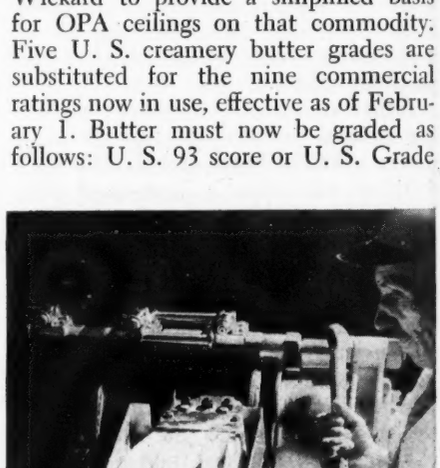
Tea—Quota restrictions and packaging limitations for tea packers were issued on Feb. 6 in Food Distribution Order No. 18. No packer may accept delivery of more tea during his quota period than his total acceptance quota for that period as determined by the Director from time to time, and wholesale receivers are restricted by the same regulations.

Canned Grapefruit Juice—Amendment 2 to Food Distribution Order No. 3, issued Jan. 29, further restricts the sale of canned grapefruit juice except by government contract. Between Jan. 6 and March 31, no processor may sell grapefruit juice except pursuant to a government war contract; a processor may sell and deliver canned grapefruit juice prior to April 1 only if he notifies the purchaser that the delivery of the product is subject to the terms of the order and the purchaser is required to hold the grapefruit juice until after March 31.

Lard—An order designed to provide approximately 1,050,000,000 lb. of lard to meet war requirements this year was issued on Feb. 13 by the Food Administration. Food Distribution Order No. 20, beginning Feb. 14, requires packers to reserve 50 percent of their weekly lard production for government use. Despite the order, civilian supplies during 1943 will be increased slightly over 1942 amounts.

Butter Grades Revised

GRADES for creamery butter have been revised by Secretary of Agriculture Wickard to provide a simplified basis for OPA ceilings on that commodity. Five U. S. creamery butter grades are substituted for the nine commercial ratings now in use, effective as of February 1. Butter must now be graded as follows: U. S. 93 score or U. S. Grade



Press Association

MARGARINE GETS A BREAK

The shortage of butter has given margarine its first real break with consumers in many years. Made from vegetable oils and pasteurized skim milk, processed under sanitary conditions, and often enriched with vitamins, the product is finding favor among many housewives who never bought it before. The picture shows bars of margarine being extruded preparatory to cutting in 1-lb. blocks.

AA for top grade; U. S. 92 score or U. S. Grade A for the next grade; U. S. 90 score or U. S. grade B for the next grade, and U. S. 89 score or U. S. Grade C for the lowest table grade. Butter below that grade will be labeled "U. S. Cooking Grade."

The basis for determining the new grades is the same in principle as that previously employed.

Food Industry Plans War Ad Campaign

At a meeting in New York sponsored by Grocery Manufacturers of America, plans were drawn up on February 4 to enlist all branches of the food industry in a comprehensive coordinated advertising campaign to help the war effort. Called at the suggestion of the Office of War Information and the Advertising Council, the meeting led to the decision to seek the support of the industry's advertisers for six information campaigns which the OWI has under way or is planning. These include: (1) The 1943 farm production goals; (2) victory gardens; (3) point rationing; (4) nutrition and food conservation; (5) recruiting of agricultural labor, particularly part-time workers for the harvesting season and for peak periods in processing plants; (6) an explanation of the overall food situation.

Army To Aid Fisheries

Assurance that a large percentage of the floating equipment chartered by the Army will be returned to the Alaska salmon fishing industry in ample time for seasonal operations was given on February 4 by Secretary of War Stimson. Should it be impossible to return the floating equipment chartered, the War Department plans to loan similar equipment to the salmon fishing industry.

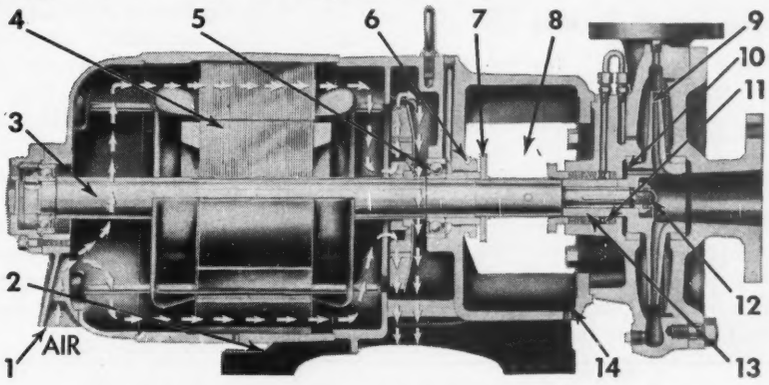
IFT To Meet June 2-4

Dates for the 1943 meeting of the Institute of Food Technologists were set last month—June 2-4. To be held in St. Louis, the meeting this year will be devoted principally to wartime packaging problems and food preservation. Several hundred food technologists are expected to attend.

Packaging Exposition

American Management Association's annual Packaging Exposition and Conference will be held at the Hotel Astor, New York, April 13-16. The exhibits and conference sessions this year will be particularly helpful because of the many problems introduced by shortages.

Engineered by WORTHINGTON as a *single unit* the MONOBLOC Centrifugal Pump is an outstanding example of compact dependability.



SAFEGUARDS OF PERFORMANCE

1. Correct distribution of ventilating air for motor
2. Extra-high motor support prevents flooding . . . base-plate unnecessary
3. Extra-large diameter one-piece shaft
4. Drip-proof motor with pyramid base
5. Extra-large shielded bearings
6. Solid front head on motor trough . . . no drip enters bearings
7. Correctly designed Neoprene water slinger
8. Greater accessibility for stuffing box inspection
9. Hand finished and balanced impeller
10. Hydraulic balance relieves pressure on stuffing box . . . reduces thrust
11. Extra-deep stuffing box
12. Special construction of impeller lock nut
13. Shaft sleeve extends through stuffing box
14. Extra strength . . . base, motor-end bell and pump bracket, in one piece

WORTHINGTON is the first to build a complete line of truly MONOBLOC *one-unit* pumps for ¼ to 60 horsepower; capacities to 1600 G.P.M; Heads to 500 feet.

SEND FOR BULLETIN W-321-B14

CP3-2

WORTHINGTON
MONOBLOC CENTRIFUGAL PUMPS
WORTHINGTON PUMP AND MACHINERY CORPORATION
General Offices: HARRISON, NEW JERSEY — District Offices and Dealers in All Principal Cities

Wickard Issues Overall Directives

ONE OF THE functions of the Food Distribution Administration has been the issuance of overall directives delegating authority of various branches of food control. Food Directive 1 extended the authority of OPA to include the exercise of control over the sale, transfer, delivery or other disposition of processed foods by or to any person, and control over the acquisition and distribution of processed foods by any person. The Directive permits more effective rationing of foods by OPA.

Food Directive No. 2, issued February 8, delegated to the Secretary of Interior responsibility for the production of fish and other aquatic life.

Bigger Farm Goals Set

NEW and bigger goals for the production of food crops in 1943 have been announced by the Department of Agriculture.

The crops for which higher goals are set are soybeans, flax, potatoes, dried beans, dry peas, sweet potatoes and grain sorghums. While the goal for peanuts was not raised above last year's 2,000,000-acre level, those who can grow more peanuts are offered a special payment. The same applies to fresh truck crops. The special incentive payments are to be made on increases over 90 percent and up to 110 percent of the goals set for the crop on an individual farm.

Oleo Standard Upheld

THE Federal Security Administration's standards for oleomargarine were judicially affirmed on Jan. 21, in a decision holding that the order does not conflict with the statutory provision prohibiting addition of substances to make a food appear better than it is, nor with the statutory provision requiring that imitations be labeled as such. The ruling, made by the United States Circuit Court of Appeals, Eighth Circuit, denied the petition of Land O'Lakes Creameries, Inc., and Twin City Milk Producers Association. National Cooperative Milk Producers' Federation and National Dairy Union also intervened in the action. The Court ruled that the determination of the Federal Security Administrator that an order establishing a food standard will promote honesty and fair dealing in the interest of consumers cannot be disturbed. His right to make the judgment is equivalent to a discretionary power to act, which cannot be judicially reviewed.

LAUNCH "EAT BEANS" DRIVE

Mrs. Darelle Shirley, president of American Grandmans' Association, receives first bag of fresh beans in the drive to promote greater use of beans during wartime. Patsy D'Agistino, director of National Retail Grocers Association, hands her the beans, while Jack Conaboy, New York Supervisor of the Food Distribution Administration, points to a special poster distributed by New York State Bean Shippers Association to grocers tying up with the "Eat Beans More Often Drive."

Parker Heads Technologists

M. E. PARKER, manager of production, Beatrice Creamery Co., has been elected chairman of the Chicago section of the Institute of Food Technologists. M. L. Laing, chief chemist, Armour & Co., is vice-chairman; R. W. Pilcher, assistant research director, American Can Co., is treasurer; and E. S. Stateler, Associate Editor, FOOD INDUSTRIES, is secretary, the latter being reelected.

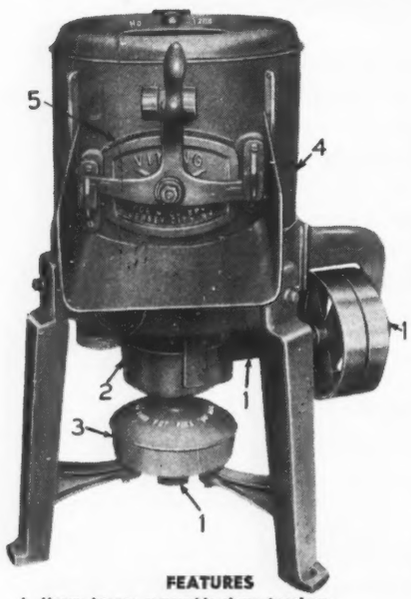
Wanted—Names Of Plant Designers

OUR AID has been solicited to build up a list of engineering firms which profess to be able to understand complete dehydration plant design. The need is urgent as a war matter.

The specifications are that the firm or consulting engineer shall be able to design the entire plant from receiving and preparation departments to packaging and shipping departments. Also that the firm or consultant have had the necessary training to understand the principles incorporated into a detailed engineering design, not be obligated to push any particular system irrespective of its application, and preferably have had actual experience in dehydration plant design.

Please send name, details of experience and qualifications to FOOD INDUSTRIES, 330 West 42nd St., New York, N. Y.—THE EDITORS.

The VIKING PEELER



FEATURES

1. Heavy bronze removable sleeve bearings.
2. Cut bevel gears, 4 Pitch.
3. 10" dia. thrust bearing running in oil.
4. Genuine carborundum abrasive FUSED onto entire inner surface of peeling Hopper and upper surface of revolving Disc. Abrasive cannot be torn by foreign material in Hopper.
5. Moulded one piece rubber gasket guaranteed water-tight for the life of the machine.

Essential Equipment for

CANNERS and DEHYDRATORS

of

White Potatoes — Horseradish
Sweet Potatoes — Radishes
Carrots and Beets — Turnips and Yams

• OPERATION

Peels and washes—and drains peelings—all in one operation; belt or motor driven.

• CAPACITIES

50 to 60 lbs. per minute—1,000 lbs. per hour
70 to 75 lbs. per minute—1,400 lbs. per hour

• ECONOMY

Waste reduced to absolute minimum—and recoverable for cattle feed. Most economical in first cost, operation, maintenance and space.

Manufactured by

ROBINSON BROTHERS

153-155 Clarke Avenue
Jersey City, N. J.

Contractors to:

U. S. Navy Department; U. S. Army Medical, Quartermaster & Engineer Corps; U. S. Dept. of Justice; U. S. Veterans Bureau; U. S. Marine Corps; Civilian Conservation Corps; State, County and Municipal Governments.

WPB Orders

Refrigerating, Air Conditioning—Higher preference ratings were assigned for emergency repair of industrial refrigerating and air-conditioning systems in an amendment to Order P-126, issued Jan. 21. The amendment restates the three classifications of users of refrigerating and air-conditioning systems entitled to priority ratings, and raises the ratings for replacement parts for the three classes.

Army Not To Release Canned Food Stocks

WHILE OPA assured civilians that plentiful stocks of canned foods are on hand to meet the needs of the rationing program, Army officials last month spiked rumors that the Army planned to release from fifteen to twenty million cases of canned goods for civilian use. Recent charges against the military food procurement program had inspired the belief that Army supplies of canned foods were overabundant and that some would be relcased to civilians.

Canners' protests against Army overbuying, which culminated in a formal statement to the Food Administration by J. Frank Grimes, president of the Independent Grocers Alliance, charged that if the Army's needs for the 1943 pack were overestimated, the entire rationing program would be thrown out of gear. In informed circles, Army stockpiling of canned foods was believed to be an ace in the hole against a possible crop shortage.

New Dehydrated Soup Is Rich in Protein

DEHYDRATED SOUP with a protein content of about 35 percent, making it an excellent supplement to meat, has been announced by the Department of Agriculture. It is made of pea meal (derived from wrinkled varieties of dried peas), soybean grits and dried skim milk, according to a formula developed by the Agricultural Research Administration.

SCHEDULE OF EVENTS

MARCH

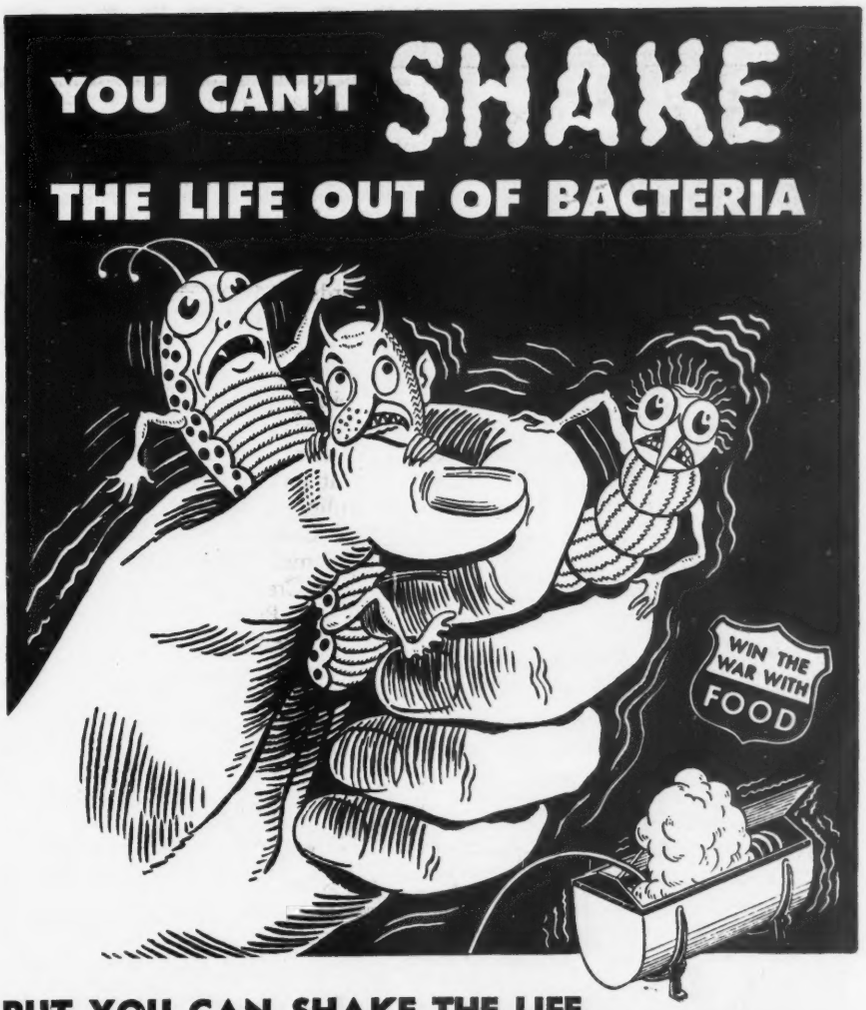
8—Spring course in baking and milling technology, Siebel Institute, Chicago, Ill.

8–11—American Society of Bakery Engineers, annual meeting, Edgewater Beach Hotel, Chicago, Ill.

24–25—Special war problems program, annual Wisconsin Dairy Manufacturers' conference, University of Wisconsin, Madison, Wis.

APRIL

13–16—Packaging Exposition and Conference, Hotel Astor, New York.



BUT YOU CAN SHAKE THE LIFE OUT OF EQUIPMENT

The constant throbbing of a steam hose in a tank or vat of water soon opens up seams, loosens fittings, brings on costly repairs which are increasingly difficult to make these days. Wide fluctuations in temperature impose a similar penalty when coolers, freezers and other food processing equipment are treated with steam.

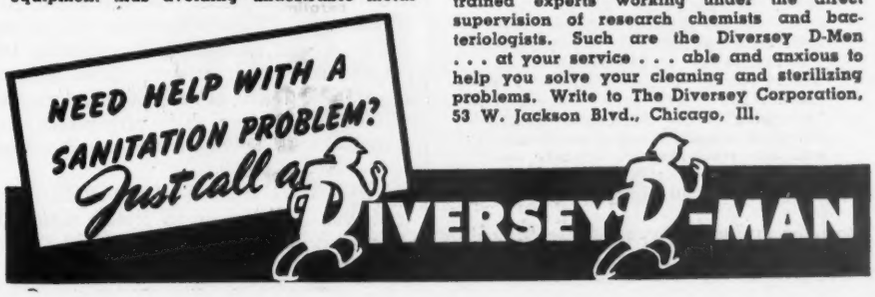
Furthermore, disinfecting contaminated containers and processing equipment with steam is at best a gamble. Authorities on sanitation agree that a temperature of 170°-180° F. maintained for two to five minutes is required to kill food spoiling bacteria. Actual tests reveal, however, that only 12 inches from the nozzle, *steam drops more than 30° below the minimum required for complete disinfecting!*

Why take chances with vital food supplies in these critical days? Bring food spoiling bacteria, mold and yeast under effective control with Diversol, the dependable chlorine bactericide. Although powerful and quick-acting, Diversol will not corrode or damage equipment thus avoiding undesirable metallic off-tastes and flavors. Comes in pure white, readily soluble crystals of uniform fixed strength. Simply add to water and this streamlined bactericide is ready for action . . . just rinse or spray the previously cleaned equipment. There is no sludge, no muss, no film, no scale. DIVERSOL is non-poisonous and leaves no after-taste or disinfectant odor. It is the ideal bactericide for the food plant.

How hot is steam?
Just place a thermometer at varying distances from the nozzle of a steam hose and see for yourself.

Diversey D-Men At Your Service

Today, more than ever before, problems in sanitation require the individual attention of trained experts working under the direct supervision of research chemists and bacteriologists. Such are the Diversey D-Men . . . at your service . . . able and anxious to help you solve your cleaning and sterilizing problems. Write to The Diversey Corporation, 53 W. Jackson Blvd., Chicago, Ill.



If it's a Paper Packaging for Food we have it! ★

Whatever the package, for whatever the food, we can supply it to your specifications or design it especially for you! Further, because restrictions in other industries in which we have been packaging leaders has released much of our resources, we now are in unusually favorable position to meet many needs—oftimes can meet emergency demands from warehouse stock while awaiting mill deliveries! ***Prices?*** You get the advantage of our large-volume buying. Investigate; send sample or specifications for quotation. No obligation whatsoever.

Packaging Division
E. W. TWITCHELL INC.

Public Ledger Bldg. Philadelphia, Pa.

★PACKERS OF DEHYDRATED FOODS will find here ***every*** known type of paper packaging for dehydrated foods . . . each carefully tested and proved equal to, or superior to any other leading packages. Consequently, consultation with us is quick way to compare the merits of all the best dehydrated foods packagings on the market . . . will save you much "shopping" time. And, you are assured of unbiased recommendations and our wholehearted, friendly cooperation in determining the best package for your product and purse.

Specialist in Special-Purpose Paper Packagings

CAPITAL VIEWS

WHEAT FOR ALCOHOL—Contracts have been arranged to process many million bushels of wheat to make "granular flour" for the government, with a feed byproduct, of course. This product, which is new to the wheat miller, will be used instead of corn for industrial alcohol manufacture. From 56 lb. of it one makes 5.45 gal. of alcohol, in comparison with 5.0 gal. from an equal weight (bushel) of whole corn. Thus novel food technology helps in speeding alcohol manufacture for explosives, synthetic rubber and other essential war uses.

EFFICIENCY DISCOURAGED – While attempting to protect the public, a desirable end, OPA has incidentally discouraged manufacturing efficiency in certain industries. Almost regardless of the way in which improved manufacturing methods are developed, it is now required that all of the saving in these industries be passed on to the customers. Where the cheaper methods of manufacturing result in a somewhat inferior product, perhaps necessary during the war, the public surely should have most, if not all, of the manufacturing economy. But when OPA says no matter how you save any money you must pass it on to your customers, and incidentally you cannot use it to offset higher taxes or higher labor cost, then we get bureaucracy at its worst. New OPA-Boss Brown better do a lot more housecleaning in his new establishment in order to deserve more complete industrial cooperation.

DANGEROUS BARRIERS—Many states have laws which are trade barriers against logical interstate commerce. The government is attacking these laws and hopes that many of the state legislatures now in session will repeal these unfair restrictions. Food executives who know where troubles of this sort exist, and have ideas of how to correct them, will do well to seek early cooperation from the officials of the Bureau of Foreign and Domestic Commerce.

DOLLAR-A-YEAR MEN OUT – Food Administrator Wickard wants no dollar-a-year men in the Food Administration. He reasons, perhaps rightly, that such officials, having a natural and proper interest in their peacetime business, have difficulty in taking administrative responsibility for decisions where their own company or their own industry is involved. But the Secretary, certainly with good judgment, is retaining these men transferred from WPB as "consultants" in the Food Administration. Their judgment and advice will be sought, and probably generally followed. Actually it relieves these men of the embarrassment of necessity for decisions, without eliminating their very proper and desirable good influence for sound action.

GOOD AND BAD STANDARDS—Food companies which want to protect nationally advertised brands will welcome the campaign started in February by Charles A. Halleck, congressman from Indiana. He is urging that the Committee on Interstate and Foreign Commerce of the House conduct a preliminary investigation to find out how private brands are being destroyed and how excessive simplification and standardization are attempted under the guise of wartime economies. Mr. Halleck emphasizes that there are good standards and bad standards. He discriminates carefully, saying "Standards misused can destroy quality, create mediocrity, stifle competition, slow up progress, destroy initiative, help the shyster, eliminate brands as consumer guides and regiment production." Many food technologists know that a brand carefully protected to represent always good quality and dependable performance for the consumer must not be destroyed by either stupid or paternalistic officials. Without the opposition led by Representative Halleck, they may be.

COLORED MARGARINE—Some spokesmen of the dairy interests are terrified by the thought that during the war period Congress might move to permit colored margarine without the present 10-cent excise tax. The fact that millions of housewives who cannot get all the butter needed for their families now use margarine, and rather like it for some purposes, adds greatly to the butter man's terror as to possible new competitors. It is going to be interesting to see how far American housewives will go in tolerating artificial restrictions on the margarine which they now urgently need. Since there are more voting housewives than there are voting dairymen, Congress may be scared a bit away from its normal and very generous support of the dairy lobby. Certainly the legislative spokesmen for butter have a new public relations worry on their minds, as well as a worry about competitors.

ALL AID FOR FOOD—The seriousness of the food situation is more and more appreciated in Washington daily. As a result, every agency of the government is developing a means for cooperating with the food administrator to make sure that no means available is neglected for increasing the total food supply. Divisions of the food industries which have any difficulty in getting something essential can now count on Secretary Wickard's staff to help them wherever aid is needed. This is clearly proved by the cooperation accorded during February on such things as more power through rural lines where shortage of energy threatened to restrict food output, and a comparable action that insured more harness leather so that animal power may be most effectively used. Food executives should not neglect this source of help when they otherwise seem stranded on official shoals.

EARLY ORDERS—Food processors have been urged for weeks to place orders for any needed equipment required at any time this year even before March. Theoretically, orders now placed can get no atten-

MISSING IN ACTION

Colonel Douglas C. MacKeachie, who two years ago was called from his post as purchasing director of the Great Atlantic and Pacific Tea Co. to be assistant coordinator of defense purchases in the office of Donald M. Nelson, and who recently has been serving in the Army as general purchasing agent for the European theater of operations, was reported missing in action on February 2.

tion. But practically, really essential equipment orders involving steel, copper or aluminum will be helped where necessary.

MORE RATIONING—There is no danger that all foods will be immediately rationed as urged by certain labor leaders. But lots more foods will soon come under controls as shortages and irregularities of supply develop. The best guide as to early actions expected is in the list of those commodities which OPA has been asked by the food administrator to investigate. Included are condensed and evaporated milk; jellies, jams, preserves, fruit butters; pickles and relishes; processed fish and shell fish; and food products containing meats.

Linseed Oil Is Used For Food in Russia

LINSEED OIL has long been used to some extent in Russia for food purposes. Recent official releases disclose that Lend-Lease has been shipping large quantities to that Ally, probably to be used principally for food. Use in the food industries in the United States is also in prospect. Experiments have disclosed that an excellent shortening can be made from oil either partly or wholly linseed. The hardening of such oils by hydrogenation is entirely feasible. Commercialization of this development may be necessary, as prospective shortages of food fats are even more serious that shortages of drying oils.

Diversion of this and other drying oils to be part of our food supply may become quite a significant trend.

Many of America's great manufacturers who are beating their schedules — know and rely on Standard Conveyors for a smooth, uninterrupted flow of work in process. Standard Conveyor engineers have helped them to streamline their handling methods—to keep production synchronized — to utilize every square foot of working space more effectively—to make man-hours count more in increased production. Standard power or gravity conveyors can provide fast, smooth "runways" for your output through all steps in manufacturing. Send for the 84-page "Standard" booklet FI-3, showing conveyor applications and possibilities in a wide range of industries. If you are producing war material or other products regarded as necessary to the war effort, Standard Conveyors are available for your handling needs.

Write for full information.

STANDARD CONVEYOR COMPANY

General Offices: North St. Paul, Minn.

Sales and Service in All Principal Cities

★ ENGINEERED FOR FASTER PRODUCTION ★

OPA Regulations

Coffee Rationing—Amendment 9 to Ration Order 12 provides that certificates to be issued for roasted coffee may not be acquired without purchase warrants. After receiving a certificate of weight value any retailer or wholesaler must surrender to the board for cancellation coffee stamps in weight value equal to the amount of roasted coffee to be received by him, according to the amendment issued on Jan. 28.

Molasses—OPA on January 19 issued amendment 90 to Supplementary Regulation 14 of GMPR adjusting and modifying maximum prices for dealers in cane blackstrap and beet sugar molasses, according to specific differentials over and under the tank car price of individual dealers.

Corn—A recent OPA order extended the ceiling on corn through March, clarified the off-grades rule, and placed a limit on farm sales of the commodity. Corn mixed with 90 percent white takes a 15-cent a bushel premium over the comparable ceiling for mixed yellow, and white corn takes a similar premium over comparable grades of yellow corn.

Powdered Milk—To facilitate small-lot purchases by bakers of both bulk powdered skim milk and bulk powdered skim buttermilk, OPA on Feb. 1 issued Amendment 2 to MPR 289, setting maximum prices for sales and deliveries of less-than-carload lots of these dairy products at levels ½ to 1 cent per pound higher than those now prevailing for full carload purchases. The order also created new pricing zones for skim milk, and reduced discounts on sales and deliveries by manufacturers to wholesalers from 5 to 3 percent.

Peanuts, Peanut Butter—Amendment 1 to Temporary MPR 23, issued Feb. 6, places a ceiling of 21 cents per pound for peanut butter on government purchases of the product.

The amendment, which enabled AMA to purchase its February, 1943, requirements for school lunch and Lend-Lease needs, raised the former 18-19 cent per pound ceiling on peanut butter to meet the market price, higher now than during the base period.

Maple Sirup—MPR 312, issued Jan. 27, established maximum prices for maple sirup, reflecting to producers prices equal to the highest prices required by the Emergency Price Control Act of 1942 and Executive Order No. 9250. A producer's maximum prices for maple sirup sold to packers encompasses four grades of the product, Fancy AA, A, B and C, and packers' ceiling prices are based on similar grades. Included in the order are regulations governing the sale of "flavoring" maple sirup.

Canned Shrimp—To curb recent price rises in sale of canned shrimp, OPA on Jan. 27 issued MPR 311 setting ceiling prices on wet pack and dry pack, per dozen, f.o.b. the shipping point nearest the cannery. The maximum price regulation includes five grades of canned shrimp plus prices for veined shrimp which run 60 cents higher per dozen.

Domestic Cheese—An increase of 3 cents a pound for so-called foreign types of domestic cheese was announced on Feb. 10 in amendment 11 to MPR 280, to place manufacturers of these types on a fair competitive basis with manufacturers of Cheddar cheese, the largest selling cheese on the American market. Primarily affected by the raise are manufacturers of brick, Munster, Swiss, Limburger, cream and Italian-type cheese.

Bakery Products—MPR 319, issued on Feb. 8, provides maximum prices for certain bakery products, taking into consideration the present cost of ingredients and packaging materials, labor costs at March, 1942, wage rates, an a dollar-and-cents mark up as of a specific base period. Commodities covered by the regulation include cakes other than cookies, pastries, doughnuts, sweet yeast raised goods and pies.

Unfinished Wines—To modify maximum prices on unfinished wines, OPA on Feb. 9 issued Amendment 105 to Supplementary Regulation 14 to GMPR. The new regulation fixes a seller's maximum price for a particular kind and type of unfinished wine on a comparable basis with wine of the same kind and type sold in finished condition. A seller's customary differentials charged in March, 1942, for bulk unfinished wine in barrels or other containers larger than 4½ gal. capacity but less than a carload lot may now be charged for the same container size.

UNHERALDED HEROES!

Our compliments to the men of the Merchant Marine. We are proud that the ships they man are equipped with Jamison Cold Storage Doors.

Uncle Sam's fleets are now getting the best that our 50 years' experience can provide.

When Victory comes, the best will be yours.

Today, for service suggestions to increase the life of your doors, consult our nearest branch, or address

JAMISON COLD STORAGE DOOR CO.
JAMISON, STEVENSON AND VICTOR DOORS
HAGERSTOWN ★ *MARYLAND*

JAMISON-
BUILT COLD STORAGE DOORS

How To Protect Plants

To HELP industrial plants protect themselves from the effects of any enemy action, the Office of Civilian Defense, Washington, D. C., has issued a booklet entitled, "Passive Protection for Industrial Plants." This booklet discusses the personnel management and organization necessary to protect factories, and also the physical installations and constructions required. A suggested organization chart is included. Copies of the booklet can be obtained from the OCD.

Conservation Orders Under New Control

IN LINE with Wickard's recent policy of transferring control of foods from WPB to the Food Distribution Administration, several conservation orders were placed under the new supervision during the month. Food Distribution Order No. 12 restricting the use of cold storage butter supersedes WPB Order M-267. The wartime ban on whipping

cream, formerly WPB Order M-259, was reissued as Food Distribution Order No. 13. Allocation of dried fruits, formerly under WPB Order M-205, is now Food Distribution Order No. 16. Raisin production, previously administered by WPB under Order M-205-a, was transferred to Food Distribution Order No. 17. Control of tea is governed by Food Distribution Order No. 18, superseding WPB Orders M-111 and M-111-e. Food Distribution Order No. 19 governs delivery of spices, formerly under WPB Order M-127.

The new orders, and those transfers of control issued as we go to press, continue in effect the regulations of the superseded WPB restrictions.

Government Curtails Food Stamp Plan

THE FOOD stamp plan is a war casualty. As the Food Administrator said in his formal statement at the time the suspension order was issued: "Most food surpluses disappeared some time ago. Critical shortages of some foods are inevitable."

The suspension order, however, does not contemplate complete stoppage of all activities under the plan. Direct distribution of commodities purchased by the Department of Agriculture to public-assistance families is to be made when necessary. In the President's budget, AMA is recommended to receive $96,000,000, down $35,000,000 from last year, for the purpose of carrying on these activities.

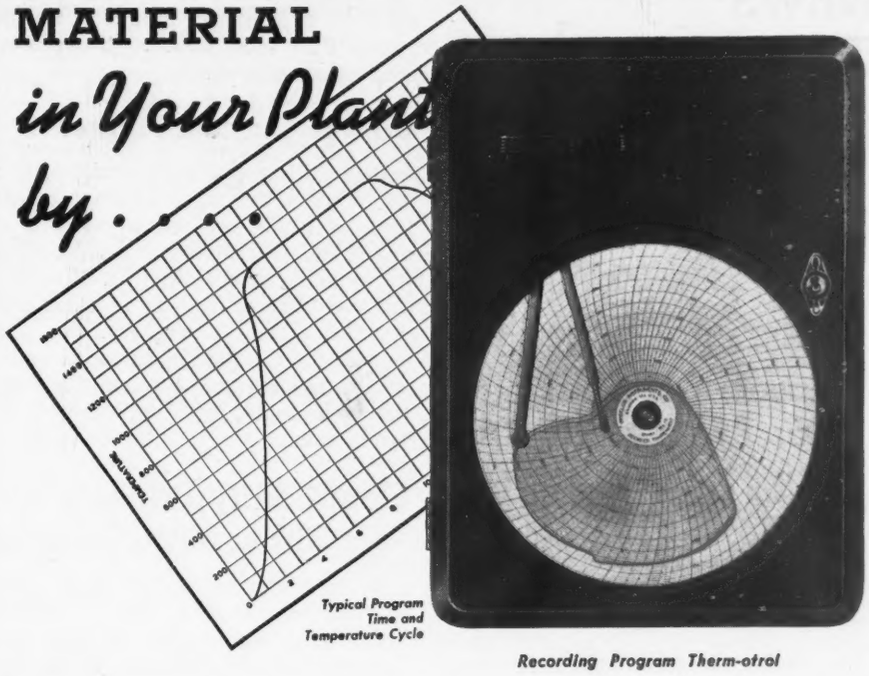
In regard to future activities, the Secretary of Agriculture has explained: "Certain commodities may still reach peak production at a time which will tend to react unfavorably on markets temporarily or geographically. The Department will continue to meet these local and temporary situations by direct purchase and distribution aimed at stabilization of markets, as directed by Congress."

Definitely to be retained as part of the war food program is the distribution of milk and other commodities for school lunches and child day-care centers.

"F" Award Considered

CREATION of an "F" award for food processing plants and food industry workers, similar to the "E" pennant and pin program already operative in industry, is under study by the Food Distribution Administration. J. L. Harrison, secretary of the Frosted Food Retailers of America, proposed the plan to bring manpower morale in the food industries to a level comparable with that in other key war industries.

Save VITAL MAN HOURS and MATERIAL in Your Plant by . . .



Typical Program Time and Temperature Cycle

Recording Program Therm-otrol

AUTOMATIC ENFORCEMENT of . . . . your HEATING or COOLING CYCLES

Wheelco Therm-otrols ("Electronic Principle" Thermometer Controllers), with Program Control integrally incorporated, will permit you to produce MORE, BETTER — WITHOUT WASTE.

These Controllers provide dependable enforcement of any heating or cooling cycle, with completely automatic temperature regulation, plus the Proved-in-Service Superiority of "Electronic Principle" Control, which eliminates the faults inherent in all mechanical controllers.

Program Control is effected by means of a rotating disc, which is so contoured as to change the position of the temperature control index. Rotation of the disc moves the index arm and changes the control setting to produce the desired temperature schedule.

Therm-otrols are available as Recording (as shown above) or Indicating Controllers and may be combined with Flame-otrol (combustion safety control), Proportioning Control or Purging Timers. Scale ranges from —70 to +1000°F., or equivalent °C.

Write for your FREE Bulletins

Wheelco Instruments Co.

823 W. HARRISON STREET • • • CHICAGO, ILLINOIS

Originator of "Electronic Principle" Temperature Controls

CONSTRUCTION NEWS

	Pending (thousands)	Awarded February (thousands)	Total Awarded 1943 (thousands)
Bakery	.....	.....	.....
Beverages	.....	.....	.....
Canning and Preserving	$340	.....	.....
Cold Storage Plants	40	.....	.....
Confectionery	.....	.....	.....
Grain Mill Products	620	.....	.....
Ice Manufactured	.....	.....	.....
Meats and Meat-Products	200	$125	$125
Milk Products	120	.....	80
Miscellaneous	380	40	270
	$1,700	$165	$475

Transportation-Saving Plan Approved by ODT

ODT early last month approved an industry transportation plan submitted by 522 dairy farmers, 75 carriers and five milk processors in Missouri and Arkansas. The industry plan consists of two parts. The first relocates milk pickup routes. And carriers will combine and revise their respective routes to eliminate nonessential mileage and obtain maximum utilization of their equipment. The second part of the plan provides for the zoning of a portion of the same milk shed which would serve evaporated milk plants operated by Pet Milk Co. and Carnation Milk Co. This part will affect 357 dairymen and 57 carriers. In the zoning contemplated, producers will be required to send milk to the nearest evaporated milk plant.

Brewer Curtails Market

SETTING a transportation-saving pattern for other industries, Anheuser-Busch, Inc., St. Louis, on February 1, discontinued beer shipments across the country to markets in California, Washington and Oregon. To stay in effect during the present emergency, the plan reduces the company's railroad car mileage by more than 14 percent and entirely eliminates truck mileage in the three states.

Commodity Prices Show Little Change

With most food prices under strict control, commodity prices showed little change in the period from mid-January to mid-February. The weekly general commodity price index of the *New York Journal of Commerce*, at 106.9 on January 16, had increased to 107.5 by February 13, but this rise was larger because of increases in industrial commodities. During the same four weeks, the same publication's weekly grain index fell from 107.1 to 105.8, while its food price index rose from 111.7 to 112.4. Spot commodity prices for basic food commodities not yet under price ceilings showed little or no change during the period.

Where Is the Meat?

This year started with record numbers of meat animals in the country and, in view of the demand for meat, expectations were for record slaughter, particularly of hogs. However, the animals failed to appear at stockyards and records of federally inspected slaughter in January, 1943, show only 8,411,000 animals slaughtered, compared to 8,938,000 in January, 1942.

Of course, favorable feed prices are causing farmers to bring fatter animals to the yards this year, so that numbers slaughtered are not a true index of meat produced. However, the meat supply is also low and fell below needs in January, as it did throughout the last three months of 1942. And this condition continued to hold through February, with receipts of animals far below expectations.

Naturally, this shortage of meat supplies has brought much speculation as to the cause. Increased slaughter for local purposes, not subject to federal inspection, and slaughter for the "black market", are the two most favored explanations, but these really explain nothing, for the meat supply is still short, in rural areas as well as metropolitan districts. Meanwhile, the food industries are still faced with the likelihood of a sudden flood of meat supplies when the animals once do start to market.

FDA Purchases Set Dehydrated Food Price

IN a recent tabulation of government purchases of canned and dehydrated foods, both the quantity purchased and the cost, f. o. b., is given. When these figures are adjusted to a unit basis they show the cost per lb. to the government and give a broad, overall picture of what the cost experience of the dehydration industry was in 1941 and 1942. The following table gives the figures:

Product	Pounds Purchased	F. O. B. Cost	Cost in cents per lb.
Beets	14,400	$5,364	36.1
Cabbage	343,600	194,060	56.4
Carrots	491,800	206,901	42.0
Onions	956,200	433,415	46.3
Potatoes	5,312,120	1,686,518	31.7
Rutabagas	250,000	45,000	18.0
Spinach	6,000	4,740	77.6
Turnips	116,200	54,432	46.9
Beef	80,000	83,200	104.0
Pork	1,264,719	1,661,015	131.3
Soup	7,344,000	1,093,474	14.9
Tomato Soup Flakes	670,000	395,300	59.0

How To Get The Most Work Out of Your VIKING PUMPS

In making suction and discharge pipe connections on a Viking Rotary Pump be sure that no strain is imposed on the pump casing by the pipe. Properly installed, the shaft of a Viking pump should turn easily by hand. If this is not possible you have either sprung the pump in making the pipe connections or with the foundation bolts.

For valuable help in installing, operating and maintaining your pumps, write today for your FREE copy of the Viking Service Manual. It's a handy, illustrated booklet filled with practical information. Get *extra* wear out of your pumps by giving them *extra* care. The Viking Service Manual tells you how.

VIKING PUMPS — FIRST IN AMERICA

VIKING Pump COMPANY
CEDAR FALLS, IOWA

INDICATORS

Flour production in January, 1943, by mills accounting for 65 percent of United States production, was 7,078,459 bbl., according to *The Northwestern Miller*. In January, 1942, production was 6,191,079 bbl. for these same mills.

Sardine pack in California for the current season up to January 28, 1943, totaled 3,234,467 cases, all sizes. For the like period a year earlier, the pack was 4,796,911 cases.

Tomato juice pack in 1942, according to final figures compiled by National Canners Association, was the largest on record, totaling 25,177,653 standard cases, compared to 23,390,935 cases in 1941.

Sauerkraut packed in the 1941-1942 season totaled 4,804,703 cases, all sizes, compared to a total of 5,240,806 cases in the preceding season, according to the National Canners Association.

Milk, fluid, daily average sales in December, 1942, as reported by the Milk Industry Foundation, were 18.75 percent higher than in December, 1941.

Butter, creamery, produced in December, 1942, totaled 116,735,000 lb., almost exactly the same as the 116,659,000 lb. produced in December, 1941, and 0.7 percent above the 1931-1940 average December production.

Butter, creamery, produced in the calendar year 1942 totaled 1,779,465,000 lb., 4.8 percent below production in the preceding year, but 4.0 above the 1931-1940 yearly average.

Cheese, American, produced in December, 1942, amounted to 42,040,000 lb., compared to 58,744,000 lb. in December, 1941, and to a 1931-1940 average production of 26,538,000 lb. for December.

Cheese, American, produced in the calendar year 1942 totaled 917,310,000 lb., compared to a production of 752,428,000 lb. in the preceding year and to an average yearly output of 473,875,000 lb. in 1931-1940.

Milk, evaporated, produced in December, 1942, totaled 178,024,000 lb., 38 percent below output in December, 1941, but 43 percent above the 1936-1940 average December production.

Milk, evaporated, produced in the calendar year 1942 amounted to 3,535,187,000 lb., an increase of 9 percent over output in the preceding year and a record for annual production.

Milk, condensed, all kinds, produced in December, 1942, totaled 59,528,000 lb., compared to 57,323,000 lb. in December, 1941. For the year 1942, total production was 835,415,000 pounds.

Milk, dried skim, produced in December, 1942, totaled 32,000,000 lb., compared to 31,272,000 lb. in December, 1941, an increase of 2 percent, and 12 percent above the 1936-1940 December average.

Milk, dried skim, produced in the year 1942 totaled 612,530,000 lb., up 29 percent above production in the preceding year.

Milk, dried whole, produced in December, 1942, was 6,600,000 lb., up from 4,340,000 lb. in December 1941, and 301 percent over the 1936-1940 average December output.

Milk, dried whole, produced in the calendar year 1942 was 59,800,000 lb., 31 percent over production a year earlier.

Eggs, frozen, produced in December, 1942, totaled 701,000 lb., compared to 265,000 lb. in December, 1941. For the year 1942 production was 257,631,000 lb., compared to 237,182,000 lb. in 1941 and to 189,578,000 lb. in 1940.

Eggs, dried, produced in December, 1942, totaled 13,402,000 lb., an increase of 62 percent over output in the corresponding 1941 month.

Chicks produced by commercial hatcheries in December, 1942, totaled 29,145,000 compared to 24,583,000 in December, 1941, and a new record for the month. For the year 1942, chick production was 1,184,657,000, exceeding the previous 1941, high record by 13 percent.

Oleomargarine sales in December, 1942, as indicated by sales of internal revenue stamps, totaled 45,195,570 lb., an increase of 34.6 percent over sales in December, 1941. For the complete year, 1942, oleomargarine sales were 365,573,364 lb., compared to 370,074,054 lb. in the preceding year.

Fruits, frozen in storage on February 1, 1943, totaled 172,130,000 lb., compared to 157,973,000 lb. on January 1, 1942, and to a 1938-1942 average of 127,797,000 lb. for the corresponding date.

Vegetables, frozen, in storage on February 1, 1943, totaled 90,346,000 lb., compared to 82,638,000 lb. one year earlier.

Butter, creamery, in storage on February 1, 1943, totaled 15,600,000 lb. A year earlier the figure was 83,106,000 lb., and the 1938-1942 average for the date was 59,915,000.

Cheese, all kinds, in storage on the first of February this year totaled 113,815,000 lb. The quantity a year before was 165,049,000 lb. and the average in 1938-1942 was 117,012,000 lb. for the same date.

Eggs, case equivalent, in storage on February 1, of this year were 1,800,000 cases, compared to 2,365,000 cases on January 1, 1942, and to a 1938-1942 average for the date of 1,199,000 cases.

Poultry, frozen, all kinds, in storage on February 1, 1943, totaled 142,128,000 lb., compared to 206,120,000 lb. a year before and to an average in 1938-1942 of 162,625,000 lb. for the same date.

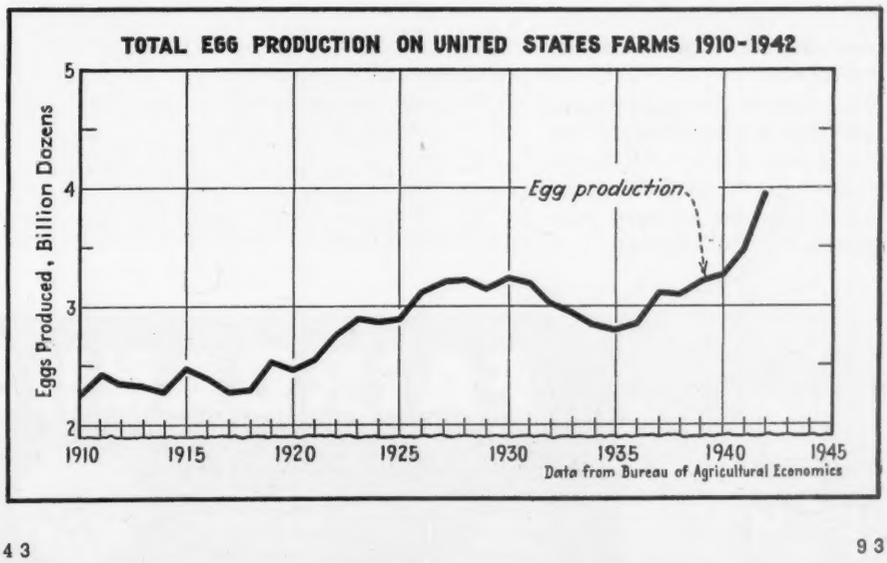
Meat, all kinds, in cure and frozen storage on February 1, 1943, totaled 803,496,000 lb., compared to 887,715,000 lb. a year earlier, and to an average in 1938-1942 of 794,217,000 lb. for the same date.

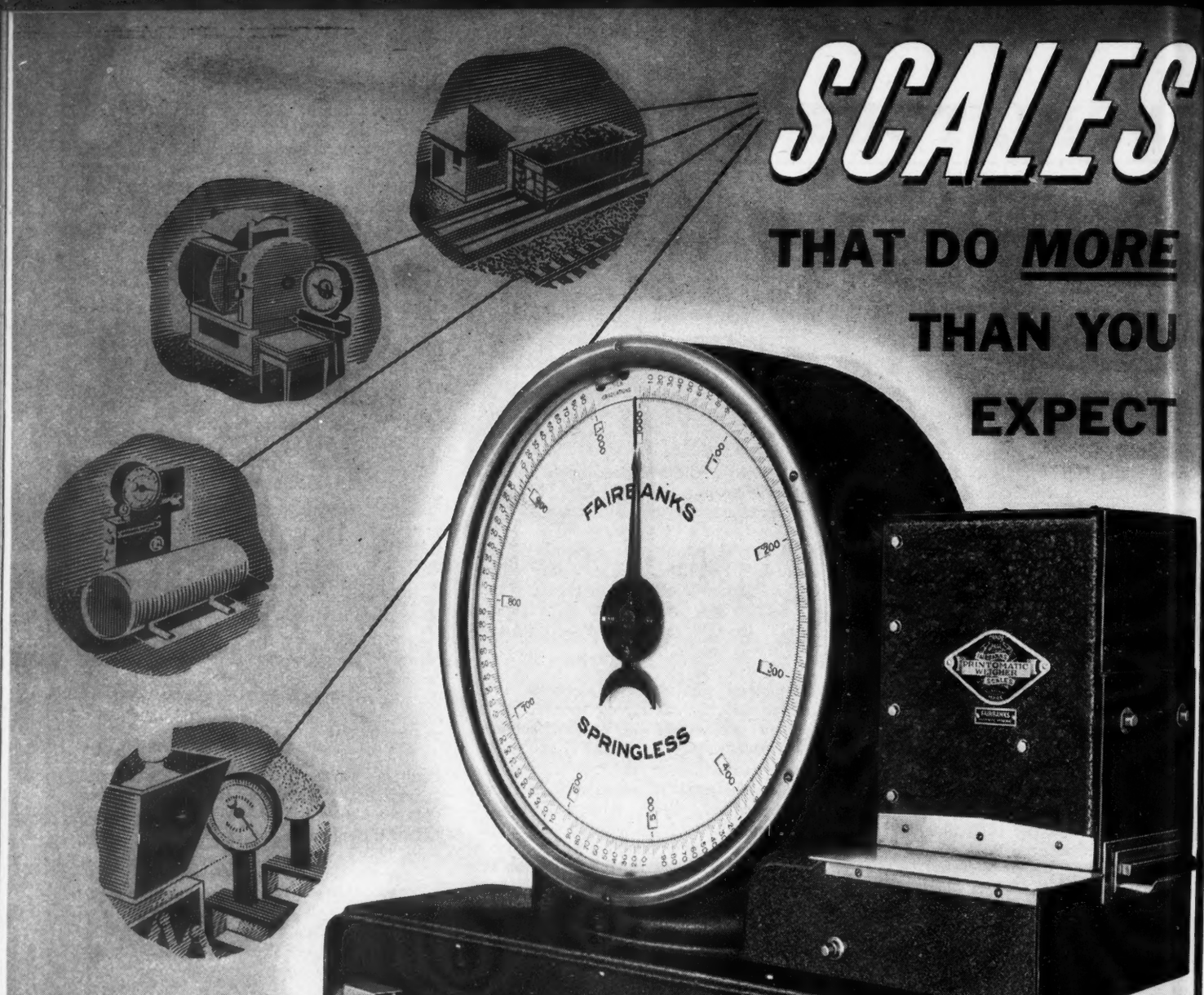
Lard in storage February 1, 1943, was 105,636,000 lb. and rendered pork fat on the same date was 6,441,000 lb. A year before the figures were 204,405,000 lb. and 5,065,000 lb., respectively. The combined average for the two products in 1938-1942 was 189,986,000 lb. on the same date.

Weekly wholesale food price index of Dun & Bradstreet stood at $4.03 at the end of January, 14.8 percent above the figure for the comparative date in 1942.

Business activity index of *Business Week* registered 195.6 on February 6, 1943, compared to 191.5 a month before, and to 170.8 on the corresponding 1942 date.

Cost of living index of National Industrial Conference Board was 101.4 in January, 1943. This compares to 101.0 in December, 1942, and was an increase of 7.3 percent over January, 1942.





OF course, Fairbanks Scales are big, husky, and accurate. You have a right to expect these things in *any* good scale — and particularly of Fairbanks Scales with the world's broadest scale manufacturing experience behind them.

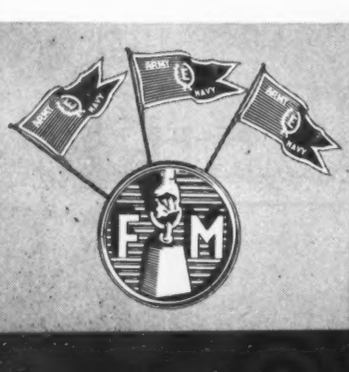
The feature about Fairbanks Scales that may surprise you the most, is their ability to do things you *don't* expect of scales.

Here are a few of many jobs done by Fairbanks Scales:

- They count small parts — more accurately than manual counting
- They weigh carloads of coal in motion and make a printed record of each weight
- They control automatically paint ingredients
- They automatically control aggregates
- They "keep the books" in steel plants, making printed records of incoming and outgoing shipments
- They keep accurate records on chlorination in water treatment
- They record the *flow* of liquid chemicals
- They guard secret formulas in compounding
- They control batching in bakeries
- They prevent disputes by eliminating the human element in weighing.

AND all of these things, only the beginning of the story, they do automatically and mechanically thereby eliminating human errors.

How Fairbanks Scales can be fitted into your production flow to speed up operations and eliminate errors may prove to be the most interesting discovery you ever made. Investigate now. Write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Illinois.



FAIRBANKS-MORSE

DIESEL ENGINES
PUMPS
MOTORS
GENERATORS
SCALES

WATER SYSTEMS
FARM EQUIPMENT
STOKERS
AIR CONDITIONERS
RAILROAD EQUIPMENT

FAIRBANKS SCALES

Scales

MEN • JOBS • COMPANIES

INDUSTRY

Appella Corp., Yakima, Wash., is now canning apple nuggets—applesauce in concentrated form—to be used by the armed forces.

California Asparagus Growers' Association recently launched a campaign to secure 3,000 Mexican workers to help harvest the 1943 asparagus crop.

College Inn Food Products Co., Chicago, Ill., is now printing "Salvage for Victory" instructions on every can label to help recover as much metal as possible.

Cranberry Canners, Inc., Hanson, Mass., purchased a former dairy plant in Gurnee, Ill., to be used for canning or dehydrating.

Denison Poultry & Egg Co., Denison, Tex., has leased storage facilities in Jackson, Miss., enabling it to handle Army, civilian and Lend-Lease wholesale egg orders.

John H. Dulany & Sons, Fruitland, Md., has been converting 40,000 lb. of sweet potatoes into 8,000-lb. of the dehydrated product, using the tunnel dehydration method.

Fine Product Corp., Augusta, Ga., will begin operation of a dehydration plant to produce dehydrated beets and sweet potatoes for government use.

Florida Citrus Canners' Co-operative, Inc., Lake Wales, Fla., is operating a new $500,000 plant to produce orange juice concentrate for use by the armed forces.

Hale County Foods Canning Co.'s plant in Plainview, Tex., will begin construction of an $80,000 unit for the Army and Lend-Lease program; the company expects to start operation on July 1.

H. J. Heinz Co. has purchased Marshall Canning Co., Marshall, Ind., which brings the number of food processing plants owned by Heinz to 26.

S. T. Jerrell Co., Birmingham, Ala., producers of dried buttermilk, is now distributing soya and peanut flours for the domestic market.

Guy A. Laurents Packing Co., meat packers, Fort Wayne, Ind., has been presented the "T" flag for 100 percent participation of employees in buying war bonds.

Nalley's, Inc., Tacoma packer and manufacturer of spices and salad dressings, has begun production of canned meats for the Army.

National Biscuit Co. recenty purchased a flour milling plant, F. M. Martin Grain & Milling Co., at Cheney, Wash., in line with the "Nabisco" policy of milling its flour at important locations to supply its many bakeries throughout the country.

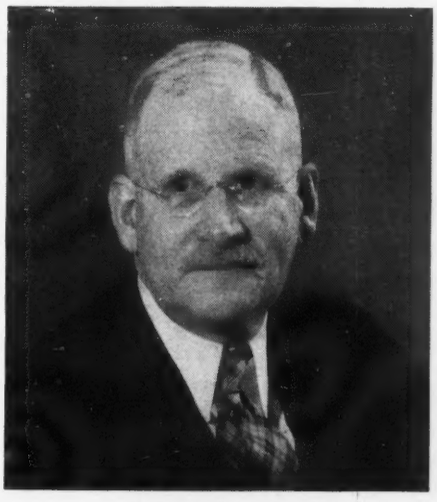
United Fruit Co., New York, N. Y., recently established a Middle America Information Bureau, which presents facts about Latin America and its relationship to the United States to help bridge the gap between North and South America.

RAYMOND B. ROOS

Continental Foods, Inc., a subsidiary of Thomas J. Lipton, Inc., Hoboken, N. J., elected Raymond B. Roos, vice-president and general manager. Previous to joining the Lipton Co., he was director of Borden Co.'s prescription products division.

WILLIAM B. HOWARD

Grocery Manufacturers of America has announced that William B. Howard, executive vice-president, recently organized the Clifton Dehydrating Co., Inc., Clifton, N. J. William J. Fay becomes vice-president and Charles J. Fay secretary-treasurer.



DR. S. C. PRESCOTT

Dr. S. C. Prescott, former Dean of Science at the Massachusetts Institute of Technology, has been named consultant on dehydration for the National Canners Association Research Laboratories. He devoted a great deal of his time to dehydration during World War I when a major in the Sanitary Corps of the United States Army.

PERSONNEL

Frank W. Abke has been elected president of Standard Margarine Co., Indianapolis, Ind. Robert G. Spears becomes vice-president. Mr. Abke was also named president of Standard Food Products, Inc.

John H. Bailey has been promoted from manager of National Milling Co., Toledo, Ohio, to manager of all National Biscuit Co.'s flour mills.

Ray F. Beerend, well known to food processors and canners throughout the industry, has been appointed president of Basic Food Materials, Inc., Cleveland, Ohio.

James H. Black, widely known in food distribution circles in the Middle West, has been elected vice-president of the Sprague-Warner division of Sprague Warner-Kenny Corp., Chicago, Ill.

Dr. Frederick C. Blanck's appointment as director of subsistence research for the Army Quartermaster Corps has been announced by the War Department. Previous to his appointment he was chief research chemist for H. J. Heinz Co., Pittsburgh, Pa.

L. O. Ehrlich, formerly vice-president and production manager of Glaser Crandall Co., has become manager of production for Martin Food Products, Inc., Chicago, Ill., manufacturer of jams and jellies.

J. F. Forsyth has been named vice-president of the central division of Best Foods, Inc., New York, N. Y.

Arthur D. Hyde is now vice-president in charge of research for General Mills, succeeding Dr. E. C. Williams. Mr. Hyde has been in charge of the experimental division at General Mills and has organized and developed the company's precision machine tool war plant.

Howard Kellog, Jr., has been elected executive vice-president of Spencer Kellogg & Sons, Inc., Buffalo, N. Y. He has been with the company 15 years, having begun as a helper in the Buffalo plant's maintenance department.

Gordon Lamont, of Lamont, Corliss & Co., was reelected president of Dairy Industries Supply Association, Washington, D. C., at its 24th annual business meeting in New York City. John W. Ladd, Cherry-Burrell Corp., became vice-president.

O. G. Martino, one of the owners of Magnolia Packing Co., Federalsburg, Md., was elected president of Tri-State Packers Association at the annual meeting in Philadelphia, Pa.

Searle Mowat, president of the Larrowe division of General Mills, Inc., in Detroit, has been named vice-president of General Mills, Inc., New York, N. Y. He continues to head the Larrowe division of the company.

C. V. Nelson has been elected director of purchasing of General Mills, Inc., Minneapolis, Minn., succeeding S. D. Andrews, Jr., who is now in Washington, D. C.

R. E. Parrish is now executive vice-president of Georgia Peanut Co., Moultrie, Ga., in charge of its nine affiliated companies. He was formerly executive head of Georgia-Florida-Alabama Peanut Association.

W. C. Platt, former chief chemist for Exchange Products Co., Ontario, Calif., has been named research and technical production manager of Bireley's, Inc., Los Angeles, Calif., processor of citrus fruit products.

A. D. Radebaugh, Blue Mountain Canneries, is now president of Northwest Canners Association. Arthur L. Reiling of Ray-Maling Co., is vice-president.

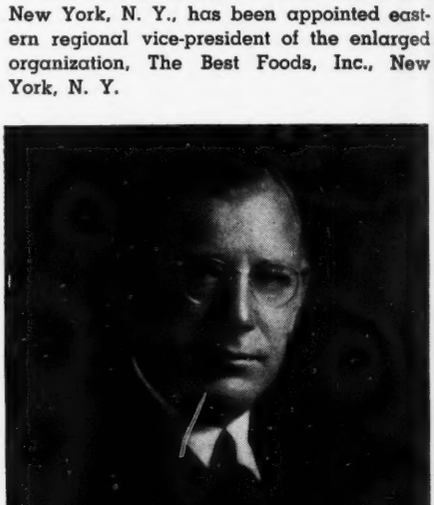
Charles A. Southwick, Jr., formerly in charge of package development and testing in the research department of General Foods Corp., New York, N. Y., has gone with Shellmar Products, Mount Vernon, Ohio, as director of research development.

Russell W. Varney, of Standard Brands, Inc., will be nutrition director of the New York offices of American Institute of Baking during the absence of Dr. James A. Tobey, who has been ordered to active duty with the rank of lieutenant colonel in the Army.

Horace M. Wigney, former chief of the refrigerator car section in the division of railway transport of ODT, has been named assistant director in charge of perishable freight service.

W. O. DILLINGHAM

W. O. Dillingham, formerly vice-president of the eastern division of Best Foods Co., New York, N. Y., has been appointed eastern regional vice-president of the enlarged organization, The Best Foods, Inc., New York, N. Y.



CARL N. LOVEGREN

Carl N. Lovegren, a leading figure in the canning industry and president of the Canners League of California, recently resigned from his position as president of Hunt Brothers Packing Co., San Francisco, Calif.

Earl B. Wilson, vice-president in charge of National Sugar Refining Co.'s raw sugar purchases and export sales, has resigned to accept an appointment as chief of the sugar section of Commodity Credit Corp., an agency of the Department of Agriculture.

DEATHS

Dr. John S. Abbott, secretary and director of research of the National Association of Margarine Manufacturers, recently, in Washington, D. C.

Joseph Feuer, 66, well-known grain exporter, organizer and president of Continental Grain Co., Jan. 29, in New York.

You can
BUY
TRI-CLOVER PUMPS and FITTINGS
NOW

If you have the proper priority. The major portion of our manufacturing facilities is now devoted to war production. However, we are endeavoring to maintain a complete stock of Tri-Clover Sanitary Fittings and Pumps—in Trialloy, nickel-plated bronze and stainless steel. Essential buyers with proper priority can get delivery. How long we can maintain complete stocks, we don't know. Production of war goods comes first, and will *continue* to come first, in our plants.

TRI-CLOVER MACHINE CO.
KENOSHA • WISCONSIN

TRI-CLOVER

Frank A. Hunter, head of Hunter Packing Co., East St. Louis, Ill., Jan. 22, in St. Louis, Mo.

Dr. W. Lee Lewis, retired director emeritus of scientific research of American Meat Institute, recently, in Evanston, Ill.

Preston McGrain, vice-president of Morton Salt Co., Feb. 6, in Chicago.

Joseph Obermeyer, 77, former vice-president of Liebmann Breweries, Inc., New York, N. Y., Jan. 26, in New York.

Louis Onetto, 94, pioneer in the ice cream industry and Buffalo's first macaroni manufacturer, Feb. 4, in Buffalo, N. Y.

Charles A. Roache, 66, chemist for Pure Foods Laboratory, Chicago, Ill., recently, in Indianapolis, Ind.

ASSOCIATED INDUSTRIES

Caterpillar Tractor Co., Peoria, Ill., has named James H. Deaderick vice-president, with administrative direction of parts, service and traffic departments.

Continental Can Co., Inc., recently named Carle C. Conway president, succeeding the late J. Frederick Hartlieb, 65, who died January 26, in New York.

B. F. Goodrich Co., Akron, Ohio, has elected John M. Davies director of physical research to supervise the study of rubber, plastics and other materials.

Jamison Cold Storage Door Co., Hagerstown, Md., has appointed J. V. Jamison, 3rd, president and general manager.

Lindsay & Lindsay, Chicago, Ill., formerly the Lindsay Structure Division of Dry-Zero Corp., has been organized to speed production of the Lindsay structure.

Arthur D. Little, Inc., Cambridge, Mass., developed an imitation cinnamon spice to replace the natural material cut off by Japan. It is now distributed by D. & L. Slade Co., Boston, Mass.

Mack Manufacturing Corp., New York, N. Y., has elected Charles T. Ruhf president. He also became executive vice-president of the parent company, Mack Trucks, Inc. Mr. Ruhf was operating vice-president in charge of factories.

Merck & Co., Inc., Rahway, N. J., and Triangle Package Machinery Co., Chicago, Ill., have been presented the Army-Navy "E" award for excellence in production.

Union Bag & Paper Corp., New York, N. Y., has announced that Norman T. Beardsley, manager of the board and pulp division, has been named chief of the kraft board unit of the paperboard section of WPB.

CORK IS AVAILABLE FOR INSULATION

HEADLINE FROM REFRIGERATING ENGINEERING, JAN. '43

Although corkboard is still under priorities, relaxed restrictions have increased its availability. In the past year and a half, corkboard has been used extensively for war construction. Despite filling these demands, shipments of cork to this country have been sufficient to build up a large reserve stockpile. Supplies are now considered adequate for essential needs.

Power conservation and protection of vital food stocks were never more important than in today's preparation for victory. That makes the availability of Mundet Cork Insulation all the more important for food processors, cold storage operators and other users of refrigeration for essential purposes. Get in touch with us immediately if you require insulation. Mundet Cork Corporation, Insulation Division, 65 S. Eleventh St., Brooklyn, N. Y.

MUNDET CORK INSULATION

CONSERVES LOW TEMPERATURE

You can BOIL Patapar

Being insoluble, Patapar* Vegetable Parchment can be soaked in water indefinitely —even boiled without harm. And it resists grease so stubbornly that products with extreme grease content can be safely wrapped in it. With these unique characteristics Patapar has come to the aid of literally hundreds of products that have presented packaging problems. Patapar is the ideal material for

Wrappers for butter, meats, fish, cheese, lard, shortening, ice cream, vegetables, dried fruit

Packaging frozen foods

Packaging coffee and tea

Milk can gaskets

Laminated Patapar as a material for containers to replace metal cans

Patapar can be furnished plain or printed in one or more colors. Our complete modern printing plant is part of the Patapar service. For full information, write us outlining your requirements in detail.

*Reg. U. S. Pat. Off.

Paterson Parchment Paper Company

Headquarters for Vegetable Parchment since 1885

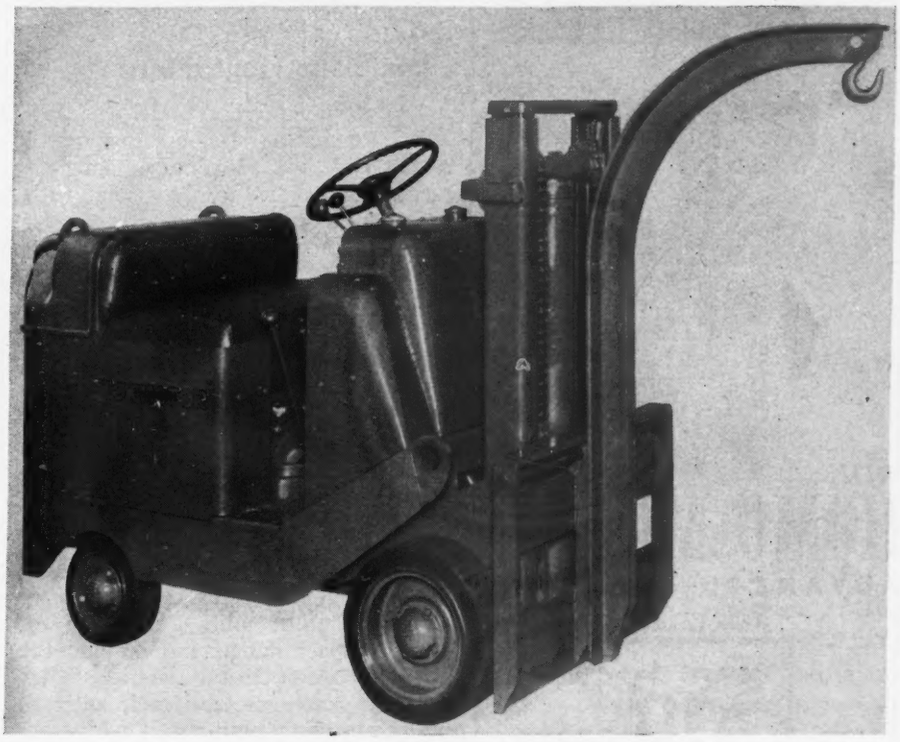
Bristol, Pennsylvania

WEST COAST PLANT: 340 BRYANT STREET, SAN FRANCISCO, CALIFORNIA
BRANCH OFFICES: 120 BROADWAY, NEW YORK • 111 WEST WASHINGTON STREET, CHICAGO

FOOD EQUIPMENT NEWS

Machine-Handling Attachment

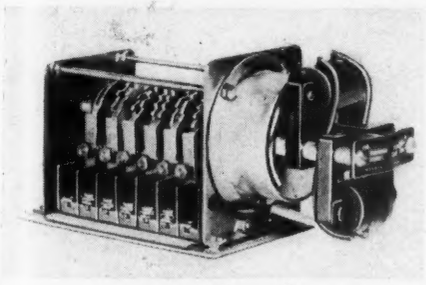
TOWMOTOR CO., 1226 East 152 St., Cleveland, Ohio, is now providing crane-arm equipment for Towmotor industrial trucks, so that these can be used for raising machines and similar loads from the floor and moving them about the plant. This crane-arm attachment can be used either with or without forks. It is easily demountable and interchangeable with standard forks, so that the truck with which it is used can be diverted to this use for a few minutes without serious interruption of its regular service.



Towmotor truck equipped with demountable crane arm.

Multi-contact Timers

FOR controlling a series of machine operations in definite order—as in reversing or alternating the operation of a group of motors, or in causing a definite sequence in operation—R. W. Cramer Co., Centerbrook, Conn., has brought out a line of multi-contact timers. These are designed to control automatically a sequence of on and off operations of



Multi-contact timer.

a single or multiple number of electrical circuits in accordance with a predetermined operating program.

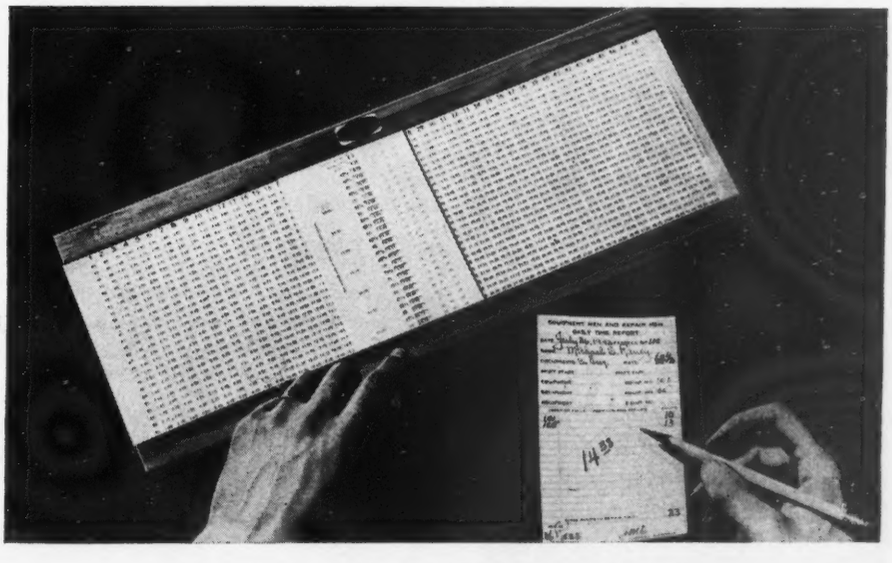
The timers employ self-starting synchronous motors with complete gear trains operating in oil, and Bakelite cams mounted on a shaft in identical pairs so that off and on increments can be adjusted to the desired operating program. Also, the timer can be manually operated, and can be provided with a remote momentary starter. Contacts are placed so that their operations can be observed.

For Bombs or Fires

AMERICAN-LAFRANCE-FOAMITE CORP., Elmira, N. Y., has brought out the "Alfco-spray," a water spray nozzle for fire fighting. This has a variable spray but no straight stream, and when in full-curtain position provides an effective water screen to protect men and property behind it. From the shut-off position, a slight turn of the tip gives a cone spray of 40 degrees. Further slight rotation produces increasing cones up to a full curtain of 150 degrees, with reversal back to shut-off without any intervening straight stream. This indicates its use where live electric circuits might be encountered. The varying cones are also excellent for extinguishing heavy oil fires, for general cooling purposes or for protection against the spread of fires from incendiary bombs.

Calculator

BERGER-BRICKER CO., 433 S. Spring St., Los Angeles, Calif., has brought out a new type of calculator on which it is said payrolls and job costs can be figured in very short time. Operating on a simple principle, this device includes all hourly rates from 50 cents to



Calculator for figuring payrolls and job costs.

S-T-R-E-T-C-H
Man Hours

WITH
HOMO-MIXER'S
ADVANCED PRINCIPLE

INDUSTRY must win the race against time! But more than a great time-saver is the Eppenbach HOMO-MIXER. It's also engineered for finer diffusion.

Its principle is wholly different. There is no vortex, no air to affect the mixture. Only a fraction of the mass is worked at one time, creating more uniform dispersion. The material is rapidly forced up from the air-free bottom by the stationary turbine fins. With tremendous pressure and turbulence, the flow surges upward, outward and down. The entire batch completes this cycle in just a minute or two. No clamping to tank, no setting at angle, no vibration.

HOMO-MIXERS are doing a big job in process plants today — batteries up to a hundred! Write us!

EPPENBACH
INCORPORATED
Processing Equipment for Over 30 Years
44-02 11th STREET
LONG ISLAND CITY, N. Y.

$1.75, with ½-cent spreads between rates. It covers all time periods up to 104 hours, with divisions of one-tenth of an hour. The construction is of lacquered wood and the device is made to fit in a desk drawer.

Plastic for Containers

A PLASTIC composition said to be suitable for replacing steel or other scarce metals for some parts in containers is manufactured by incorporating with cellulose fibers a resin powder called "Vinsol," produced by Hercules Powder Co., Wilmington, Del., according to The Patent & Licensing Corp., 30 Rockefeller Plaza, New York. The material is a thermoplastic, fibrous-resin composition and is said to be hard, dense, stiff and to have considerable toughness.

Condensation Return

FRED H. SCHAUB ENGINEERING CO., INC., 325 West Huron St., Chicago, has brought out the "Series G" line of condensation-return units. These are of new compact design and employ the least possible of critical materials. They are completely prefabricated, with all interconnecting piping and wiring installed, ready to "plug in," and can be used for a variety of condensation-return requirements. They are available for discharge pressures of from 10 to 100 lb., in capacities up to 55 gal. per minute.

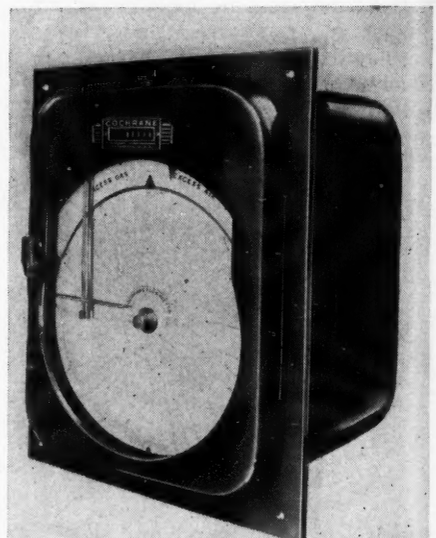
Finned Tube Heat Exchangers

THE BROWN FINTUBE CO., Elyria, Ohio, is making ready-to-use heat exchangers of finned tube construction. These heat exchangers will be built in all standard types, including the twin-section unit as shown in the picture, and in any capacity desired to meet any practical heating or cooling requirement. All of these heat exchangers will embody the Brown finned tubes, which are of special welding construction said to provide an integral bond of metal between the fins and the central member, resulting in highly thermal efficiency and trouble-free operation.

Two-Pen Flow Recorder

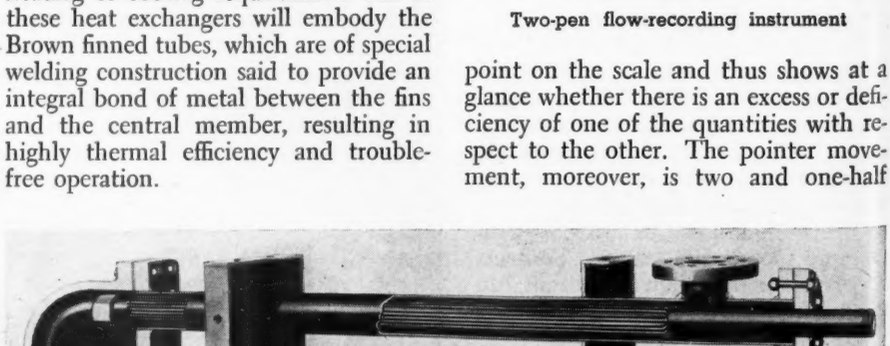
FOR use where panel space is limited, or where two related flow records are desired on the same chart, Cochrane Corp., 17th & Allegheny Ave., Philadelphia, Pa., has brought out a two-pen electric flow meter. This instrument is actually two complete flow meters mounted within one case of double depth designed for accessibility. Both receiver mechanisms can be swung out and operate in the swung-out position. The connection between the rear receiving mechanism and its pen arm must necessarily be detachable and is arranged with a self-aligning V-notch junction.

Where two related measurements are involved, the operator often has sufficient guidance by observing the coincidence, or lack of coincidence of the two pens. However, this does require that he note which pen is which. For cases where continual reference must be made to this relationship of the two records, a ratio indicating pointer can be incorporated. The clearly visible red target moves to right or left from the center



Two-pen flow-recording instrument

point on the scale and thus shows at a glance whether there is an excess or deficiency of one of the quantities with respect to the other. The pointer movement, moreover, is two and one-half



Heat exchanger constructed with Brown Fintubes.

times greater than the difference between the two recording pens and is thus more readily noted.

An integrating feature can be furnished on both mechanisms, but reading of the rear mechanism integrator requires opening the case and swinging the front mechanism forward.

Moisture Meter

RAYMOND S. HART, 1950 Grand Central Terminal, New York, offers the Type K-101 moisture meter, for the

Meter for determining moisture content of dehydrated foods.

rapid determination of moisture content in dehydrated foods and many other materials. This is a portable meter, operating on the electric conductivity principle. It is only 7x12 in. in size and operates on batteries, making it possible to use it anywhere, as it requires no connection to power lines. Also, no warming-up period or preliminary adjustments are necessary.

Operation of the meter is simple, and it is not even necessary to weigh the sample being tested. Calibrations for various materials are supplied to each meter user, and these make the meter direct-reading in percentage of moisture without reference to charts or tabulations. The operating method, which is that of comparison or direct substitution, insures against errors from changing battery voltages or other electrical or mechanical variables.

Hart moisture meters have been used in various industries and laboratories for a number of years, but have only recently been applied to checking the condition of food immediately upon its removal from a dehydrater.

Humidifier

CARRIER CORP., Syracuse, N. Y., has brought out an industrial humidifier which provides humidification and also cooling by evaporation and air circula-

1 man can do it . . .

FIFTEEN men can "manhandle" a whale of a lot of material. BUT 999 times out of a thousand one man and a Towmotor can do the same job in less time and at lower cost. It's merely a matter of moving many units as one load, stacking higher to obtain additional storage space, releasing man-power for more productive work, and . . .

But there's too much to tell here. If you want all the facts, send for a copy of our new manual, "The Inside Story." It's free; just write Towmotor Corporation, 1222 E. 152nd Street, Cleveland, Ohio.

TOWMOTOR

ARMY E NAVY

THE 24-HOUR ONE-MAN-GANG

NOW, when the need is great, you can better your production of food processing with American MonoRail equipment where handling impedes your war effort.

Later, after Victory, you will have essential equipment available for changes in product and process. American MonoRail, because of its extreme flexibility, offers such versatile application without costly adjustment or lengthy engineering.

American MonoRail standard parts fit quickly into complete systems to meet a wide variety of handling problems. Size of plant, nature of product, weight of load makes little difference.

Prepare now for changes then—equip now for speed up toward Victory!! Let our engineers show you results obtained in hundreds of installations.

THE AMERICAN MONORAIL CO.

13125 Athens Avenue ★ Cleveland, Ohio

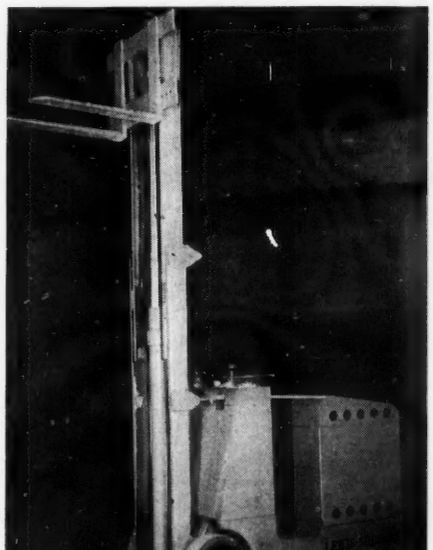
tion. It also tempers, cleans, and provides uniform circulation of air.

One of the uses put forward for this equipment is for the proper ventilation of blacked-out buildings through connection of the air supply to the outdoors. The humidifiers may be installed singly or in multiple and hence are suitable for any size of plant. In addition, they require no floor space as they are installed by ceiling suspension, use no distributing ducts and may be moved from place to place to meet plant changes.

Accessibility of all parts has been designed into the equipment. A drip pan on ball bearing rollers moves on a track, so that it may be moved out of the way to permit access to the interior of the unit. The air outlet is hinged to be swung aside providing an opening to the fan and fan motor.

Industrial Lift Truck

LEWIS-SHEPARD SALES CORP., 123 Walnut St., Watertown, Mass., have brought out a line of medium capacity industrial lift trucks. These trucks come



Industrial truck of the fork lift type, with load capacity of 3,000 lb.

with both electric storage battery and gasoline engine power, and have a capacity of 3,000 lb. load. They are available in the tilting fork type, in both the telescopic and non-telescopic models.

Design features of these new trucks are compactness and low center of gravity, in order to provide maneuverability and stability. They are constructed with a one-piece reinforced single casting main frame. Over-all length with 30-in. forks is 100 in. and width is 34 in., permitting operation in aisles 63 in. wide.

Air-Driven Mixers

MIXING EQUIPMENT CO., Rochester, N. Y., has added three models of heavy-duty air-driven mixers to its line. Two

Air-powered mixer.

of these, Models AG-33 and AG-100, are gear-reduction models and the other, Model AR-100, is direct drive. These units are particularly suitable for mixing alcoholic liquids or others where there is a fire hazard. All models are equipped with propellers and shafts of metal suitable for the work to be done. These mixers are all equipped to clamp on the side of an open tank, vat or kettle.

Labels That Adhere to Metal

EVER READY LABEL CORP., 141 E. 25th St., New York, has developed "Stick-to-Metal" gummed labels for adhering direct to metal surfaces. These are not only available as regular labels but also as stickers that carry inspection data, instructions, warnings and so on. In addition, plain gummed labels of this type are available for office procedures such as routing, scheduling and so on.

Foamless Filler

MONJONNIER BROS. Co., 4601 W. Ohio St., Chicago, recently announced a new foamless filler for filling liquids or semi-liquids into containers without any mixture of the product with air. In this device, while the container is being filled, the nozzle or filling valve remains under the surface of the product in the container, thus preventing the admixture of air. These foamless fillers are available in a number of different

Save Time in VITAMIN A Determinations

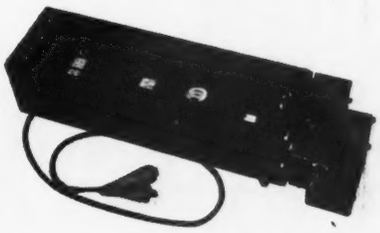
...Workers have indicated the ultraviolet absorption to be a more reliable index of Vitamin A content than antimony trichloride reaction with its attendant complications.
—Wilkie: U. S. Food & Drug Admin.

with the Beckman Spectrophotometer

The Beckman Spectrophotometer has already proved itself to be the fastest, simplest, and most accurate method for Vitamin A determinations. And, because the Beckman Instrument covers not only the visible and near ultraviolet, *but the complete range of ultraviolet* down to 220 mmu—this is the *only* spectrophotometer capable of handling ALL types of modern vitamin determination and control work!

Step up the speed, accuracy, and convenience of *your* vitamin work with the BECKMAN Spectrophotometer—the one spectrophotometer with *full range* to cover all present day vitamin work as well as future developments in this field!

Important Features of the Beckman Spectrophotometer



▶ **Entirely Self-Contained:** The monochromator, light sources, phototubes, and electrical measuring circuit are all incorporated within the instrument to insure maximum convenience, ruggedness, and accuracy.

▶ **Easy to Operate:** Measurements are quick and simple to make. Direct readings in both % Transmission and Density can be made *simultaneously*.

▶ **Remarkably Versatile:** Interchangeable light sources, interchangeable phototubes, a monochromator with full range (220 mmu in the ultraviolet to 1000 mmu in the infrared) enable the instrument to meet all the varying requirements of research and control work with no sacrifice in convenience or accuracy.

▶ **Highly Accurate:** Although unusually simple to operate and remarkably versatile, the instrument is extremely accurate over the full scale, even with low light intensities. Stray light effects are less than 1/10 of 1% over most of spectral range.

▶ **Ruggedly Built:** Optical parts are rigidly mounted in a massive heat-treated iron block, within a hermetically sealed metal case. All parts are designed for long life and sustained accuracy.

Send for complete information on the Beckman Spectrophotometer. Describe the application you have in mind and our experienced engineering staff will gladly make helpful suggestions on the use of this instrument in *your* work.

NATIONAL TECHNICAL LABORATORIES, South Pasadena, Calif.
Beckman Instrument Division

Beckman INSTRUMENTS SPEED PRODUCTION ...REDUCE WASTE

IF YOU'RE A "CONVERT", TOO . . .

no doubt you're facing problems of labeling products and packages you never expected to run up against in pre-war days.
And, as you'd expect, we, here at WORLD Labeler headquarters, have converted to out-and-out war production.

FRANKLY, HERE IS WHAT WE SUGGEST YOU DO:

1. Keep 'em running. That means careful operation and consistent maintenance. Keep your labelers properly adjusted. Don't force them beyond their rated speed. Keep them clean and well lubricated. Impress the operators with the importance of keeping their machines in commission.

2. Conserve parts. Keep all repair parts under strict control. If they can be repaired (in your own shop or ours), don't throw them away. Have them fixed and put them back on the job or keep them for spares.

3. Call upon WORLD headquarters for help on all problems of conversion or adaptation to new labeling jobs as well as for all necessary repair or service assistance.

Our knowledge and experience as builders of WORLD's finest labelers will continue to be at your command, now *as well as in the piping times of peace that lie ahead.*

ECONOMIC MACHINERY COMPANY

Builders of World Automatic and Semi-Automatic Labelers for Every Purpose

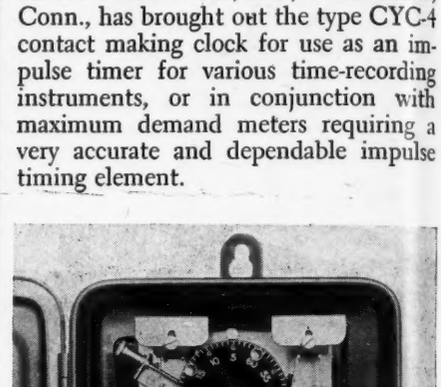
Worcester, Massachusetts

NEW YORK PHILADELPHIA PITTSBURGH CHICAGO SAN FRANCISCO DENVER LOUISVILLE
SALT LAKE CITY EL PASO SEATTLE PORTLAND LONDON MONTREAL TORONTO WINNIPEG
SPOKANE VANCOUVER SYDNEY, AUSTRALIA WELLINGTON, N. Z. SAN JUAN, P. R.

styles and in addition, various sizes of containers may be filled on the same machine.

Contact Making Clock

R. W. Cramer Co., Inc., Centerbrook, Conn., has brought out the type CYC-4 contact making clock for use as an impulse timer for various time-recording instruments, or in conjunction with maximum demand meters requiring a very accurate and dependable impulse timing element.



Contact making clock.

This clock is equipped with a motor of the hysteresis type operating at 450 r.p.m. on 60 cycle alternating current and consuming approximately 3 watts. The motor is self-starting and can be furnished for either 110 or 220 volts, or for any commercial frequency. It is equipped with an integral sealed gear train selected for the required ratio.

The contacts applied with this device are of silver and are rated at 1 amp., 110 volts, a.c. The standard setting for duration of impulse is one-fifth of a second, but this can be adjusted by means of a micrometer screw as desired. The impulse is transmitted and set at predetermined equal intervals and can be adjusted for either one, two, three, four, six or twelve per hour.

Plastic Truck Treads

Treads for industrial trucks, to replace rubber, are being molded of a Monsanto plastic by Jarvis and Jarvis, Inc., Palmer, Mass. The manufacturers state that, although less resilient and noisier than rubber, these plastic treads roll easier over smooth or rough surfaces and are easier to attach to a wheel. They are also said to give long wear. The largest wheel so far equipped with plastic treads is 10 in. in diameter.

Questions & Answers

Army Spread

A Pennsylvania dairy company technologist writes that the company has had an inquiry regarding an army spread, which he is told is a mixture of cheese curd and butter fat, testing 56 percent fat in the finished product. He asks if we can give him any information on the product.

This spread is included in a tentative specification issued by the Quartermaster Corps as CQD No. 32B, dated October 28, 1942.

The product is prepared from fresh creamery butter rated 90 score or better, fresh cheese curd having not more than 39 percent moisture, skim milk powder, salt and high quality butter flavor. An emulsifying agent must be used, not to exceed 2 percent. It is permissible, also, to use sodium benzoate up to 0.1 percent, a suitable vegetable gum not to exceed one-eighth percent, and a suitable antioxidant agent in the amount of 0.1 percent. Carotene or other butter color is permitted.

The finished product is required to have not less than 56 percent butter fat and not more than 29.5 percent moisture, with a melting point of not less than 120 deg. F.

The specifications outlined cover only the product itself. There are other requirements regarding method of inspection and test and covering packaging, labeling, packing and marking for shipment. Anyone interested in manufacturing this product should write to the Office of the Quartermaster General, Washington, D. C., for a copy of CQD No. 32B.

It is to be noted that these are tentative specifications and may be changed at any date.

Meat Substitutes

A company manufacturing special purpose foods asks whether or not we have any formulas or recipes for the manufacture of meat substitutes. It is particularly interested in soybeans, peanuts or the meals of these beans to be used as a base.

Products using soybeans have been developed by several companies as a result of their own research. We could not properly publish such formulas, unless we had their permission.

High protein products of vegetable origin, to be used as protein supplement in the diet, involve questions not only of the product itself but of labeling. It can not be claimed that such products replace meat, since they do not supply exactly the same nutritive elements, weight for weight.

Information on the use of peanuts and peanut flour can be obtained from the National Peanut Council, Inc., 812 Citizens & Southern National Bank Bldg., Atlanta, Ga.

Fruit Storage

Wine bottlers, located in the Middle West, are going into the manufacture of wines from apples, blackberries, cherries, strawberries, peaches and other available fruits. The season for many of these fruits is very short. It would be necessary to manufacture these wines in batches of approximately 5,000 gal. at one time and each fermenting period takes 10 to 14 days. The problem is to store these fruits until needed. We would appreciate help regarding the storing or preserving of these fruits for a period of one month to one year so that the quality of the fruit is not impaired.

A complete answer to this question would require a great deal more information than has been given. The right solution would be to have additional fermentation capacity so that the fruit can be taken when it is at its perfect condition, crushed, and started to ferment at the right time.

An alternative would be to utilize cold storage or freezer storage. This takes capacity, either in the wine plant or in a cold storage warehouse.

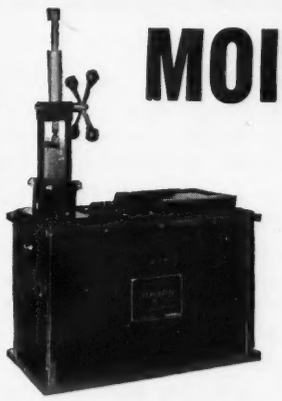
Much of what can be done will depend upon the characteristics of the variety of fruits. Apples are better if not frozen prior to crushing for cider.

These are nothing more than suggestions for a line of attack. The inquirer is urged to communicate with his own state agricultural experiment station for further information.

Coffee Tablets

From California we have a request for help in reducing a liquid coffee concentrate to tablet form.

Combinations of dextrine and dextrose should be tried. The ordinary corn sirup solids which are used in ice cream and other food products may serve, or it may be necessary to use different proportions in the dextrose-dextrine mixture. Such mixtures are being used at present in making soluble coffee powder, and experience in the confectionery field has shown that anhydrous corn sirup solids are useful in making various tablets.



MOISTURE TESTING MADE EASY

Food Dehydrators Choose Speedy Steinlite

STEINLITE one-minute Moisture Tester . . . electrical in principle . . . easy to use . . . saves money . . . speeds production . . . accuracy guaranteed.

Used in processing and in the laboratory . . . Steinlite successfully tests dehydrated vegetables, eggs, meats . . . most any ground or powdered product in one minute. Sample not damaged. Saves time and money.

Guaranteed accurate to .2 of 1% with a moisture range of 1 to 35%. Over 2800 users and a good performance record in the food industry.

***Free trial offer* explained in illustrated folder. Write for it now.**

SEEDBURO EQUIPMENT COMPANY

Seedburo Quality — Formerly Seed Trade Reporting Bureau — Founded 1912

634 BROOKS BLDG. (formerly Seed Trade Reporting Bureau) CHICAGO

He's carrying more loads, bigger loads . . . and carrying them farther. Doing a wonderful job, too, in spite of all handicaps.

You can help him. Not necessarily because you're philanthropic, but because it's to your own interests to lend a hand. It's only good business to help your railroad shipments go through undamaged . . . to prevent waste of materials, manpower, machinery, time and shipping facilities.

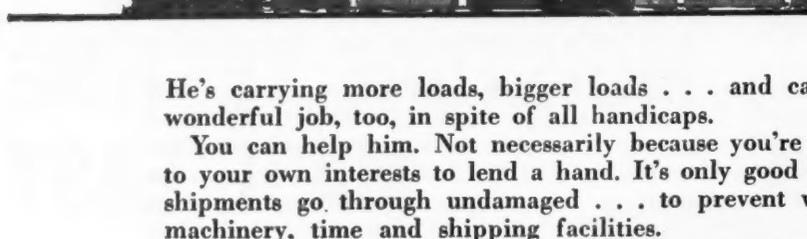
You can help tremendously merely by using better corrugated shipping boxes . . . boxes that are sturdier, stronger, better engineered to stand up under longer hauls, heavier loads, and handling by inexperienced men.

The few extra pennies in original cost will soon be dwarfed by month after month savings. You can prove that to your own satisfaction by writing the H & D Package Laboratory. Learn what has been done for others, what can be done for you.

Protect the Product

BETTER SEE H&D AUTHORITY ON PACKAGING

YOU CAN USE THESE FREE "TEXT-BOOKLETS"



Whatever you ship, wherever you ship it, you will find pages of helpful information in this "refresher-course" in packaging. Get free copies now for all key men in your distribution departments. Write . . .

***HINDE & DAUCH,* Executive Offices:**
4309 Decatur Street, Sandusky, Ohio

FACTORIES in Baltimore • Boston • Buffalo • Chicago • Cleveland • Detroit • Gloucester, N. J. Hoboken • Kansas City • Lenoir, N. C. • Montreal • Richmond • St. Louis • Sandusky, Ohio • Toronto

JUST OFF THE PRESS

BOOKLETS • LITERATURE • BULLETINS

FOOD PLANT EQUIPMENT

Filters—A 15-page descriptive booklet, "Niagara Filter Systems," which acquaints food and chemical processing technicians with the important features, construction, advantages and uses of filter systems, is issued by Niagara Filter Corp., 1432 Niagara St., Buffalo, N. Y.

Ion Exchangers—A brief factual folder, "Ion Exchangers for Industrial Processes," showing the application of exchangers in such fields as beverages, canned and bottled juices, corn sirup and corn products, flavoring extracts and sirups, is published by Permutit Co., 330 W. 42nd St., New York, N. Y.

Vitamin Data—The separation of natural vitamin A esters from fish liver oils through the process of molecular distillation is described in an illustrated 12-page catalog, "The Story of Vitamin A Esters," issued by Distillation Products, Inc., 755 Ridge Road West, Rochester, N. Y.

PLANT SUPPLIES

Combustion Apparatus—To conserve critical metals in gas-analysis apparatus, a new line of victory models employing wood, plastics and other materials is briefly described in the 6-page booklet, "Catalysis Supersedes Slow Combustion," by Burrell Technical Supply Co., 1936-42 Fifth Ave., Pittsburgh, Pa.

Lubrication—Practical information relating to the installation, care and lubrication of ball and roller bearings to secure the best possible operating performance and longevity is found in a brief booklet, "The Lubriplate Film," issued by the Lubriplate Division, Fiske Bros. Refining Co., 129 Lockwood St., Newark, N. J.

Motor Control—A 12-page bulletin, "Synchronous-Motor Control," describes the functions of both the magnetic and semi-magnetic types of full- and reduced-voltage synchronous-motor controls; issued by General Electric Co., Schenectady, N. Y.

Pumps—"Handbook for Wartime Care of Centrifugal Pumps" is the title of a 27-page illustrated manual containing specific recommendations for the care of a standard pump; issued by Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Switchgear—Horizontal drawout metal-clad switchgear in 100,000, 150,000 and 250,000-kva. capacities at 5,000 and 15,000 volts is described and illustrated in a 12-page publication, Catalog 1110, released by Roller-Smith Co., Bethlehem, Pa.

Vibration Eliminators—An engineering work sheet, necessary for the recommendation and installation of vibration insulators, in addition to a 12-page catalog, "Vibro-insulators," which describes various types of insulators and gives their applications and characteristics, have been issued by B. F. Goodrich Co., Akron, Ohio.

CONTROL EQUIPMENT

Control Equipment—A new 29-page catalog, "Micromax Electric Control," Catalog N-OOA, describes methods of handling and explains through diagrams and pictures how the equipment is adjusted to fit various needs; published by Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia, Pa.

Control Instruments—Five new bulletins describing temperature indicating, recording and controlling instruments have been issued by Wheelco Instruments Co., Harrison & Peoria St., Chicago, Ill.

Control Instruments—A loose-leaf binder of bulletins on "Automatic Control Instruments for Industrial Furnaces, Kilns, and Ovens," well illustrated with photographs, application drawings and wiring diagrams of such instruments as pyrometer, thermometer and humidity recorders and controllers, mentioning various types to meet the manufacturer's needs, is published by Bristol Co., Waterbury, Conn.

Laboratory Equipment — "Into Unseen Worlds," a 25-page booklet illustrating the development and applications of the electron microscope, not only in the study of medicine, but in such fields as bacteriology, colloids, plastics, particle size and shape and soil analysis, is published by the Engineering Products Division, RCA Victor Division of Radio Corp. of America, Camden, N. J.

MATERIALS

Flavors—A price list for such products as essential oils, citrus concentrates, aromatic chemicals, floral waters, tinctures and colors, dated January, 1943, 11-page bulletin issued by Fritzsche Brothers, Inc., Port Authority Commerce Building, 76 Ninth Ave., New York, N. Y.

Paints—Specifications for various types of wax-fortified paints, together with information on their availability and use, are given in a 10-page booklet of S. C. Johnson & Son, Inc., Racine, Wis.

Standard Alloys—A reference chart, analyses, physical characteristics and applications of 19 different stainless steel, monel and nickel alloys, together with a cross reference of designations and type numbers of various institutes, are given in a chart published by Cooper Alloy Foundry Co., 200 Bloy St., Hillside, N. J.

Surface Acting Agents—"Atlas Spans and Atlas Tweens" describes new emulsifiers, detergents and wetting agents available in experimental lots and gives tables on surface activity, specifications, solubilities and suggested uses. It is a 24-page technical booklet published by Atlas Powder Co., Wilmington, Del.

PACKAGING

Stitching Equipment—A 6-page folder titled "SilverStitchers," describing and illustrating types of carton stitchers available to shippers of war products in fiber and corrugated cartons, with detailed specifications and usages, is published by Acme Steel Co., 2840 Archer Ave., Chicago, Ill.

MISCELLANEOUS

Electronics—"Electronics—A New Science for a New World" is the name of a colorful, pictorial booklet presenting the story and functions of the electron in research, in industry to increase production and efficiency, and in agriculture to improve quantity and quality, issued by General Electric Co., Schenectady, N. Y.

Maintaining Dairy Equipment—Detailed instructions for the care and maintenance of dairy plant equipment under present war conditions is described in a reprint of the article, "Care and Maintenance of Dairy Plant Equipment During the War Emergency," by Arthur W. Farrall of Creamery Package Mfg. Co., 1243 W. Washington Blvd., Chicago.

Detergent Cleaning—How steam-detergent cleaning is utilized in canning, dehydrating, quick freezing and other food industries to speed daily maintenance cleaning, conserve man-hours and make quality control more effective is concisely described in the 24-page booklet, "Steam-Detergent Cleaning with Oakite Solution-Lifting Guns," issued by Oakite Products, Inc., 22 Thames St., New York, N. Y.

V-Belt Maintenance—"Plain Facts on Wartime Care of Rubber V-Belts" is the title of a 16-page illustrated maintenance bulletin for industrial plants, issued by Allis-Chalmers Mfg. Co., Milwaukee, Wis.

BOOKS

Data on Wages

EARNINGS IN THE GRAIN-MILL PRODUCTS INDUSTRIES, 1941. Published by the U. S. Department of Labor, as Bulletin No. 712, 1942. 39 pages; 5¾x9 in.; paper. Price, 10 cents; for sale by Superintendent of Documents, Washington, D. C.

Data published in this bulletin will be useful to management in the flour, feed and cereals industries, as well as to students of food industry economics and labor relations. Thirty-four tables are utilized to present detailed statistics, principally on the distribution of workers and their earnings.

Nutrition Values

VITAMIN VALUES OF FOODS IN TERMS OF COMMON MEASURES. By Elizabeth M. Hewston and Rosemary L. Marsh. Published by the U. S. Department of Agriculture as Miscellaneous Publication No. 505, 1942. 29 pages; 5¾x9 in.; paper. Price, 10 cents.

This compilation of technical data gives the vitamin content of raw, cooked and processed foods in terms of International Units or in actual weights where values have as yet not been established. Such foods as meats, poultry, fruit juices, fruits, vegetables, nuts, bread and cheese have been analyzed.

The vitamin A, thiamin, ascorbic acid, vitamin D and riboflavin contents have been determined for 100-gram and 1-lb. quantities and for approximate average servings.

Air Conditioning

AIR CONDITIONING ANALYSIS. By William Goodman. Published by the Macmillan Co., 60 Fifth Ave., New York, N. Y., 1943. 455 pages; 6½x9½ in.; cloth. Price, $6.

While the material in this book has been developed from an elementary point of view for the benefit of the reader, only engineers and technologists will be able to grasp the information thoroughly after they get beyond the first chapter on fundamentals. Much of the book is devoted to the physics of air conditioning, but some practical engineering information is contained in the chapters on the capacity of the refrigerating plant and on the fundamental conditioning processes.

Incidentally, the science of air conditioning has taken on wider importance for the food engineer with the rapid development of dehydration. And while this book does not consider dehydration, some of the principles are applicable.

Looking Ahead

GOALS FOR AMERICA. By Stuart Chase. Published by the Twentieth Century Fund, 330 W. 42nd St., New York, N. Y., 1942. 134 pages; 5½x8 in.; cloth. Price, $1.

There is little about food in this book that will be new to the man in the food industries, although the author devotes a chapter to a discussion of general trends in the field of food. But the book as a whole will help you to visualize what is ahead in the postwar era, and the future of the food industries cannot escape the economic and social conditions of that era.

The author approaches the future with this question in mind: How much would we need to produce, in terms of goods and services, to provide every man, woman and child in America with a decent minimum standard in food, clothing, housing, education and health care?

Mayonnaise Problems

MAYONNAISE AND SALAD DRESSING PRODUCTS. By M. H. Joffee. Published by Emulsol Corp., 59 E. Madison St., Chicago, Ill., 1942. 169 pages; 6½x9½ in.; cloth. Free to manufacturers of mayonnaise, $2 to others.

Help on problems in the manufacture and distribution of mayonnaise and salad dressing is found in this revised edition. Special attention is given the chemical analysis of raw materials and finished products. Theories of emulsification and the chemistry of fats, oils and eggs are discussed. Chapters are devoted to the interpretation of the Federal Food, Drug and Cosmetic Act as it pertains to the mayonnaise industry and to tentative Quartermaster Corps specifications for mayonnaise and related products.

Food Industry Directory

FOOD PRODUCTS DIRECTORY, 1942–1943. Published by W. J. McCamman, 1202 Hearst Bldg., San Francisco, Calif. 876 pages; 8x10¼ in.; cloth. Price, $10.

This is a new edition of the "Blue Book of Food Packers," a directory of canners, packers and manufacturers of food products, food brokers and distributors, wholesale grocers and importers and exporters for the United States and its territories. It also includes a buyer's guide, which is a classified list of companies furnishing supplies to canners, packers and shippers.

AMERICAN MANAGEMENT ASSOCIATION

WARTIME PACKAGING CONFERENCE AND EXPOSITION

★

HOTEL ASTOR NEW YORK

APRIL 13 to 16 1943

★ ★ ★

For convenience in locating the name of a company, canners and packers are listed alphabetically by states, and in addition to the name of the company the directory lists the main office, location of plants, officers or members of the firm, the commodities packed, brand names and how the products are packed. Then these canners and packers are classified according to commodity packed and also according to brand names. Another list gives concerns who have foods packed under their own brands by other companies, and still another list names the companies packing in glass.

Compiled from information collected by the publisher by means of inquiries sent to the firms in the various classifications, the directory is a convenient, though not 100 percent complete, reference volume.

Letters to the Editor

"Desecrated Vegetables"

To the Editor
of FOOD INDUSTRIES:

I have just finished reading, with very much interest, your article on dehydration improvements in the December issue of FOOD INDUSTRIES. Unfortunately, the points that you bring out are all too true.

The Agricultural Supplies Board, amongst a lot of other things, controls to a very great extent the production of dehydrated vegetables in Canada. British and Canadian armed services requirements of these products are supplied through our Board, which secures them by purchase from the manufacturers under the terms of suitable contracts. To qualify for a contract the plant must be equipped to manufacture the product required. It must be in an operating condition "satisfactory to the Board." It must use processes furnished or approved of by the Board. It must operate under the supervision of the Board. The finished product must meet specifications furnished by the Board and must be packaged as specified.

Production in Canada is not large when compared with that of some countries, but there are eight plants operating ten large tunnels, and our output runs into the thousands of tons. All the plants are constructed along virtually the same lines. All use the same dehydrating principle. All have the same type of preprocessing equipment, most of it furnished on a loan basis by the Board. All have, or can have, an adequately equipped control laboratory, supplied by the Board. The quality control operator, selected by the plant, can be given a technical course of instruction at the central laboratory, conducted by the Experimental Farms Service.

All plants are inspected daily, a report being made covering quality of raw material, peel and trim jobs, blanch temperatures and periods, dehydrater temperatures and periods, peroxidase tests and general remarks. A sample representative of the day's run is taken and submitted to a local laboratory for moisture, peroxidase and sulphite determination, and each week a composite sample, representative of the week's run, is sent to the central laboratory for a cook test, general quality estimation and occasional vitamin assay.

Each day's run is date marked and coded and on the day following manufacture is placed under detention by the visiting inspector. The detention is lifted when the daily analysis shows the product to be O.K.

By this time you are probably scratching your head and wondering how the dickens such a control system can function. I wonder at it myself and keep on hoping, because I must admit that all our plants are not yet operating. They will be very shortly. If this control scheme continues to work out it will only be because the Experimental Farms Service, the Marketing Service and local universities cooperate with us very wholeheartedly.

At the outset of this letter I said that all the points brought out in your article are unfortunately all too true. I now reiterate that. A daily factory inspection and the taking of quarter-pound samples for inspection do not constitute effective control, perhaps I should say complete control, in view of the fact that all plants operate on a 24-hour daily basis. The only effective control is in the hands of the plant management.

Let us now go back a few years. It is my understanding that desiccated vegetables were supplied for the feeding of troops during the Boer War. They were popularly referred to then as "desecrated vegetables," and probably properly at that. I have been told that in the scramble that accompanied the opening phases of World War I, desiccated vegetables that had been made for the Boer War were resurrected and supplied to that "contemptible little army" of Britishers that have their counterpart in those glorious few who did so much in the recent defense of their England. In 1914 they were still "desecrated vegetables." By 1917 and

INSURE YOUR FOODS' PURITY
with
Filtrine
FILTERS

You're working under strain. The demands on your facilities are heavy. Let FILTRINE help by removing *completely* all rust, sand, clay, vegetable and other suspended matter from your water lines. This is a valuable help today, when most sources of water supply are doing double duty.

FILTRINE is an inexpensive help, too, because it lasts a lifetime. When saturated, its filter medium can be replaced in a matter of minutes.

What more important pure ingredient than water? Then why not *clean water?* Let FILTRINE make it so.

FILTRINE Storage Type water coolers are important to you, too. Whatever your need, you will find a FILTRINE COOLER, especially designed to fill it. There is a wide variety of models and capacities.

Write today for further information on FILTRINE FILTERS, FILTRINE COOLERS or both. Please explain your problem as completely as possible.

In use for almost forty years

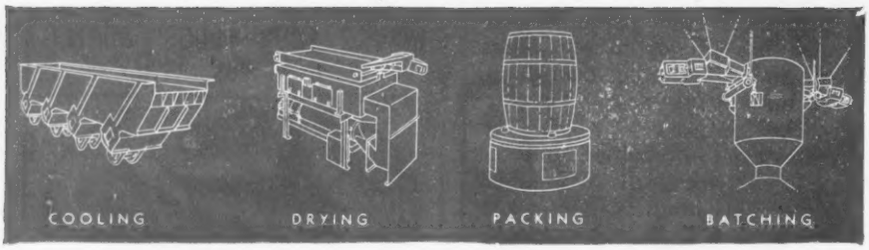
Filtrine
MANUFACTURING COMPANY
53 Lexington Ave., Brooklyn, N.Y.

Want to sift dried eggs or some other powdered, dehydrated food product?

BAR-NUN Rotary SIFTER

The Bar-Nun's ability to pack large capacity into little floor space makes it ideal for dehydrators who must size or remove lumps from their products. Thorough, clean separations guaranteed. Nine sizes, 4 to 60 square feet of cloth surface. Write for complete information.

B. F. Gump Co
Established 1872
454 South Clinton Street, Chicago, Ill.



CONTROLLED PROCESSING
WITHOUT WASTE
J-T COOLERS DRYERS

Jeffrey-Traylor water-sprayed cooler for plastics. Has built-in drip pan and is equipped with nose screen for scalping out foreign materials. Auxiliary units may be easily installed between cooling and drying sections.

In Jeffrey-Traylor (remember the name) drying and cooling systems the rate and depth of material being conveyed is automatically controlled . . . changed to conform with varying requirements as material travels through various operations.

Direct type coolers and dryers furnished with either perforated or louvered conveying surface through which drying or cooling air or gases are passed. Indirect types have solid conveying surface, adaptable for handling fine materials. These units specially valuable for processing under closely-controlled conditions.

Balanced high frequency vibration under absolute control—that's the basis of Jeffrey-Traylor equipment which includes: feeders, screens, conveyors, grizzlies, weighing and proportioning devices, and barrel packers.

Investigate J-T dryers and coolers—if you are handling delicate or sensitive materials—and want positive control over tonnage.

Jeffrey-Traylor indirect dryer employing hot air jackets. Has disintegrating screen interposed between drying sections for elimination of agglomerated lumps. Also direct type dryers with screen or louvered conveying surface.

(Patented)

THE JEFFREY MANUFACTURING COMPANY

927-99 North Fourth Street, Columbus, Ohio

Baltimore, Birmingham, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Harlan, Houston, Huntington, W. Va., Milwaukee, New York, Philadelphia, Pittsburgh, St. Louis, Salt Lake City, Scranton

Jeffrey Manufacturing Co., Ltd. of Canada, Head Office & Works: Montreal. Branch Offices: Toronto, Calgary, Vancouver.

through to 1919 the production of dried vegetables in North America had reached quite large proportions. Demand was heavy. Profits were high. The business was a good one. Plants sprung up all over the country. But the product was just dried vegetables, or, to be more accurate, vegetables dried. At that, maybe, it was all right because nobody knew any better. Perhaps they did not want to know any better. It would be interesting to find out how much of the 1914-1919 production was actually used and how much of it was deliberately fed to Davey Jones. In any case that's just history now, though its influence may still be felt.

Only a few months ago I supervised the destruction of tons of dried vegetables that had been prepared by a World War I method for World War II. That incident justified our taking over production control.

Let us go back again. From 1919 to 1939 production was small, though there was admittedly some progress in manufacturing technic, particularly during the middle 30's. My work at that time gave me a hand in it and we did a lot of groping in the dark. Some manufacturers lost quite a lot of money—the ones that had faith in the industry. But for the most part the product stayed down at the bottom of the jobbers' list along with the dog biscuits.

Then came World War II and the rest is common knowledge.

I am satisfied that dehydrated vegetables of suitable quality can be manufactured by presently known methods, provided every phase of the processes is carefully performed. I am confident that any manufacturer can meet our specifications. But he cannot meet them nor produce a suitable product with dirty thermometers or leaky blanchers. He cannot dehydrate to required moisture levels without scorching if he uses the "steamed spectacles" method of humidity estimation!

The boys that are doing the fighting for us deserve nothing but the best. Some of us have the privilege of seeing that they get it. When the manufacturers realize that they have a responsibility in this, when they realize that they are not working for the defense of their own purse strings alone, when they will be proud and pleased to serve their own products in their own homes, then may they give themselves a modest pat on the back for their contribution to the war effort and for their assistance in the establishment of an industry that has all the earmarks of a mighty future.—R. W. Arengo-Jones.

Editor's Note: *Dr. Arengo-Jones is technical adviser in fruit and vegetable processing of the Canadian Agricultural Supplies Board, Ottawa, Canada.*

PATENTS

Egg Whites Freed From Chalaza and Made Uniform in Consistency During Passage Through Inclined Trough Equipped With Stationary Perforated Plate Positioned Vertically in Trough and Parallel to Second Perforated Plate Moving in Reciprocating Manner—Stanley G. Christianson, Chicago, Ill. No. 2,305,061. Dec. 15, 1942.

Fruit Mechanically Graded for Size on Weight Basis—Edward A. White, Clarkston, Wash. No. 2,305,212. Dec. 15, 1942.

Shell Eggs Preserved by Dipping in Water Solution of Alkali-metal Metaphosphate—Golden Latshaw, Pittsburgh, Pa. No. 2,305,263. Dec. 15, 1942.

Coffee Packaged in Bag-type Container Constructed to Permit Opening By Pulling on Closure Tab—Stetson Avery, Holliston, and Chauncey A. Hall, Melrose, Mass., to La Touraine Coffee Co., Boston, Mass. No. 2,305,402. Dec. 15, 1942.

Raw Meat Sealed in Cans Gradually Heated From 40 Deg. F. to 120-150 Deg. F. to Give Center Temperature of 125-130 Deg. F., Chilled at 40 Deg. F. Until Center Temperature is not Over 65 Deg. F. and Then Heat Treated Until Center Temperature is at Least 160 and not Over 170 Deg. F.—Stephan L. Komarik, to Griffith Laboratories, Inc., Chicago, Ill. No. 2,305,479. Dec. 15, 1942.

Meat Mass Heated Until Mass Reaches 125-130 Deg. F., Subjected to 40-Deg. F. Conditions Until Mass Cools to at Least 65 Deg. F., Vacuum Sealed and Subjected to 180 Deg. F. Until Coldest Content of Can Reaches at Least 160 and Not More Than 170 Deg. F.—Stephan L. Komarik, to Griffith Laboratories, Inc., Chicago, Ill. No. 2,305,480. Dec. 15, 1942.

Bulk Foods Packaged in Tubular Container Formed of Fibrous Material Closed With Slip Cover at Each End With Disk of Fibrous Material Separating Slip Cover From Contents of Package and Supporting Ends of Container Body; Closure Completed by Multiple Layers of Tape Encircling Flange of Each Slip Cover—Isaac L. Wilcox, to Oswego Falls Corp., Fulton, N. Y. No. 2,305,506. Dec. 15, 1942.

Flavor Imparted to Foods at Time of Use by Adding Nonvolatile, Nonoxidizable Ingredient Chemically Reactive to Release Flavor and Aroma Characteristics of Volatile Oil—Roland E. Kremers, Summit, N. J., to General Foods Corp., New York, N. Y. Nos. 2,305,620, 2,305,621 and 2,305,622. Dec. 22, 1942.

Green Coloring in Peas and Other Foodstuffs Fixed During Processing by Soaking From 3-30 Min. at Room Temperature in Alkaline Solution Containing From 1/5-1/10 Normal Alkali-metal Hydroxide—Arthur E. Stevenson and Keith T. Swartz, Chicago, Ill., to Continental Can Co., Inc., New York, N. Y. No. 2,305,643. Dec. 22, 1942.

Pepsin Recovered From Animal Stomach Linings by Acid Digestion Mixed With Sodium Acetate to Give Clear Water Solutions—Harvard L. Keil, to Armour and Co., Chicago, Ill. No. 2,305,714. Dec. 22, 1942.

Levulinic Acid Produced by Acid Digestion of Pine Wood Under Pressure—Georg Scheuing and Wilhelm Konz, Ingelheim-on-the-Rhine, Germany, to Alien Property Custodian. No. 2,305,738. Dec. 22, 1942.

Mannitol Crystals Used as Dusting for Edibles to Give Substantially Non-hygroscopic Exterior Surface—James R. Frorer, to Atlas Powder Co., Wilmington, Del. No. 2,305,960. Dec. 22, 1942.

Coffee Beverage Composition Ground at Temperatures From —15 Deg. C. Down—William Redmond Johnston, Bronx, N. Y., to Standard Brands, Inc., New York, N. Y. No. 2,306,061. Dec. 22, 1942.

Sulphur-containing Foods Packaged in Tinplate Containers Having Inner Surface Treated With Trisodium Phosphate and Sodium Chromate to Prevent Discoloration of Tin—Arthur E. Stevenson, Chicago, Ill., to Continental Can Co., Inc., New York, N. Y. No. 2,306,143. Dec. 22, 1942.

Dough Mixed in Vertical Machine Prevented From Climbing Up Beater Hook by Mechanical Device—Edgar Duke, Idaho Falls, Idaho. No. 2,306,245. Dec. 22, 1942.

Chewing Gum Made to Contain Hard Perillo Chicle Base and Chocolate Liquor to Give Chocolate Flavor—Charles C. Walker, Groveland, Fla., to John W. Glenn, Buffalo, N. Y. No. 2,306,415. Dec. 29, 1942.

Beer and Other Food Container Given Wax Lining That Has Melting Point Above Pasteurizing Temperature and Is Devoid of Brittleness—Albin H. Warth and William C. Rainer, to Crown Cork & Seal Co., Inc., Baltimore, Md. No. 2,306,576. Dec. 29, 1942.

Wine Treated With Extract of Fruit Pomace, Seeds and Skins Which Provide Source of Tannin and Colloidal Constituents—Julius H. Fessler, to Pomoeno Products, Oakland, Calif. No. 2,306,618. Dec. 29, 1942.

Sodium Glutamate Crystallized From Solution by Aid of Solubility-inhibiting Alcohol—Paul R. Shildneck, to A. E. Staley Mfg. Co., Decatur, Ill. No. 2,306,646. Dec. 29, 1942.

Soybeans Flaked by Passage Through Crusher Rolls, One Having Fixed Axis of Rotation and Other Having Movable Axis—Harry Truax, Indianapolis, Ind. No. 2,306,655. Dec. 29, 1942.

Fermented Yeast-containing Wort Heated to 48-60 Deg. F. in From ½ to 2 Hr. to Drive Off Fermentation Gases and Undesirable Green-beer Constituents Preparatory to Making Fermented Malt Beverage—Anton Dolenz, one-half to Dorothy K. Dolenz, San Francisco, Calif. No. 2,306,717. Dec. 29, 1942.

Poultry Given Electrical Shock and Bled During Slaughter in Continuous Automatic Manner—Edwin R. Biffinger, one-half to J. B. Collier, Sr., Ft. Worth, Tex. No. 2,306,773. Dec. 29, 1942.

Solutions of at Least 5 Percent Concentration Thickened by Addition of Caprylic Acid Mono-ester of Triethanolamine — Morris Katzman and Frank J. Cahn, to Emulsol Corp., Chicago, Ill. No. 2,307,047. Jan. 5, 1943.

Cane Sugar Molasses and Other Molasses With Higher Sugar Content Blended to Give Uniformly Homogenous Liquid Molasses—Thomas E. Moutray, Industrial City, Mo., to Universal Royalty and Development Co., St. Joseph, Mo. No. 2,307,062. Jan. 5, 1943.

Glycerine Oils Hydrobleached to Form Products With Minimum of Unsaponifiable Components and With Improved Color and Stability—William J. Paterson, Newton Highlands, Mass., to Lever Bros. Co., Cambridge, Mass. No. 2,307,065. Jan. 5, 1943.

Concentrated Liquid Ice Cream Mix Made To Be Free From Sandiness Although Having Total Solids Content in Excess of 60 to 65 Percent—Herbert E. Otting, Westerville, and James J. Quilligan, Columbus, Ohio, to M & R Dietetic Laboratories, Inc. No. 2,307,234. Jan. 5, 1943.

Root Vegetables With Vegetative Tops Mechanically Handled Without Crushing Tops—Ford C. Davis, Hartville, Ohio. No. 2,307,257. Jan. 5, 1943.

Nut Butters Made by Cutting Action of Revolving Fine-mesh Screen Against Whose Surface Is Held Continuous Feed Supply of Nuts Under Light Pressure—George A. Fisher, Indianapolis, Ind., to William S. Scull Co., Camden, N. J. No. 2,307,398. Jan. 5, 1943.

Murky Vegetable Protein Solutions Clarified by Floatation Involving Formation of Small Bubbles—Glenn Davidson, Aurora, Ill. No. 2,307,453. Jan. 5, 1943.

Corn Sirup Made From Degerminated Corn Without Separating Insoluble Starch and Nonstarchy Components Prior to Hydrolizing of Starch—Raymond E. Daly, Chicago, Ill., and James F. Walsh, Tuckahoe, N. Y., to American Maize-Products Co. No. 2,307,491. Jan. 5, 1943.

"Tortoise Salt" vs "Hare Salt"

ONE OF OUR most difficult problems in selling Diamond Crystal Salt is the apathy of food technologists and salt buyers toward salt. Too often they say, "Oh, well, salt is salt."

Take solubility: In salting butter, salt must dissolve with lightning speed. If the butter fat is on the soft side—lacking in body—at certain seasons, butter salt must dissolve so quickly that overworking is avoided. Otherwise, the butter may lose its desirable physical properties and become mottled or marbled—and may lose its moisture, become leaky. Yet, if the salt is not properly dissolved, the butter may be gritty. On the other hand, in salting cheese, slow solubility of salt is highly important. Otherwise, salt is lost in whey, producing undersalted cheese.

To meet these problems, we have set up definite solubility standards for Diamond Crystal Salt. Our Diamond Crystal Butter Salt, for example, dissolves completely in water at 65° F. in less than 9.8 seconds—average rate, 9.2 seconds. Quality-minded food processors can depend on Diamond Crystal products, manufactured under strict quality-control standards for solubility rate.

NEED HELP? HERE IT IS!

If salt solubility enters into your processing, drop a line to our Director of Technical Service. He will be glad to recommend the correct grade and grain of Diamond Crystal Salt for best results in your plant. Diamond Crystal, Dept. J-3, St. Clair, Michigan.

DIAMOND CRYSTAL
ALBERGER PROCESS **SALT**

100%
FREEDOM
from INSECT
INFESTATION

for Flour, Cereals, Spices, Granulated, Powdered or similar free flowing dry materials—including

DEHYDRATED PRODUCTS

Pictured is manual operation of "ENTOLETER" at the H. C. Brill Co. plant in Newark, N. J.

STOPS INSECT INFESTATION

"ENTOLETER" shown above handles 15,000 lbs. per hr. Also in sizes to handle 2,000, 5,000, or 10,000 lbs. per hr."

"'ENTOLETER' is in daily operation . . . doing a marvelous job." writes Vice Pres. H. A. MacArthur of the H. C. Brill Company, Newark, N. J. He continues, "The flours we work with are susceptible to infestation: rice kernels; wheat germ; wheat middlings and similar grains. Convinced complete destruction of insect life takes place through 'ENTOLETER.'"

Proof is convincing. We have it in actual plant operating records and certified laboratory tests: *"ENTOLETER" Control positively destroys all forms of insect life in free flowing dry materials!*

Inexpensive. Easy to install and operate. Extremely low maintenance. Prompt deliveries NOW! • ENTOLETER DIVISION, The Safety Car Heating & Lighting Company, Inc., 230 Park Ave., New York, N. Y.

ENTOLETER
INFESTATION DESTROYER
REG. U. S. PAT. OFF.

CONTINUOUS DESTRUCTION OF ALL INSECT LIFE

Chocolate-coated Products Cooled During Passage Through Tunnel Compartment on Continuous Conveyor Countercurrent to Movement of Chilled Air Moving in Partially Closed Circuit That Permits Recirculation—Alonzo Linton Hausman, to National Equipment Co., Springfield, Mass. No. 2,307,562. **Jan. 5, 1943.**

Flour Bleached by Suspending Individual Flour Particles in Air Blast Containing Gaseous Bleaching Medium—Hugh McDonald, to Pillsbury Flour Mills Co., Minneapolis, Minn. No. 2,307,631. Jan. 5, 1943.

String Beans and Similar Elongated Vegetables Cut Lengthwise by Mechanical Action of Device Inside Container Rotating About Upright Axis That Forces Beans and Like Against Knife Edges Tangent to Segmented Plate Positions to Cover Part of Inner Circumference of Rotating Container—Bruno Weirauch, Brunswick, Germany, to Alien Property Custodian. No. 2,307,721. Jan. 5, 1943.

Potato Starch Conversion Products Made From Pulped Potato by Conversion of Starch Content Prior to Its Separation From Nonstarch Components—Raymond E. Daly, Chicago, Ill., and James F. Walsh, Tuckahoe, N. Y., to American Maize-Products Co. No. 2,307,725. Jan. 5, 1943.

Fish Oils Hydrogenated, Added to Vegetable Oil, and Further Hydrogenated to Give Tasteless and Odorless Shortening With Vitamin Content—James G. Blaso, East Elmhurst, N. Y., to Natural Vitamin Corp. No. 2,307,756. Jan. 12, 1943.

Citrus Fruit Freed From Outer Bitter-cell-containing Surface by Lathe-like Parer—David L. Ellis, to Kwintupl Marmalade Co., Seattle, Wash. No. 2,307,829. Jan. 12, 1943.

Macaroni, Spaghetti and Similar Doughs Subjected to Mechanical Spreading Between Forming Die and Pressure Cylinder of Press—Frank Spinozzi, to G. D'Amico Macaroni Co., Steger, Ill. No. 2,308,552. Jan. 19, 1943.

Vegetables Mechanically Cleaned in Drum Open at Both Ends Rotating About Inclined Axis and Fitted With Rotary Brushes—Samuel Olson, Chicago, Ill. No. 2,308,775. Jan. 19, 1943.

Fatty Materials Stabilized Against Deterioration by Addition of Gum Guaiac Solution—John L. Doegey, to Industrial Patents Corp., Chicago, Ill. No. 2,308,912. Jan. 19, 1943.

Meat Products Subjected to Inert Gas Under Greater Than Atmospheric Pressure to Inhibit Deterioration—Llewellyn B. Parsons, Arlington, Mass., to Cudahy Packing Co., Chicago, Ill. No. 2,309,007. Jan. 19, 1943.

Dressed and Freshly Drawn Poultry Held in Shape-molding Support During Freezing by Flowing Refrigerant—John Nelson Crider, Sunnyside, Long Island, N. Y. No. 2,309,046. Jan. 19, 1943.

Canadian Patents

Meat Smoked in Inner Wrapping of Sheet Regenerated-cellulose and Temporary Outer Wrapping of Stockinet; Outer Wrapper to be Removed Prior to Sale—Bernard Paslawski, Toronto, Ontario. No. 408,468. Nov. 10, 1942.

Gas Escaping From Flour Doughs Measured by Means of Manometric Gage Equipped With Device for Periodic Photographing of Gage Reading—Johnston Edgar and Harry Miller, to the Deputy Minister, Department of Agriculture, Dominion of Canada, Ottawa, Ontario. No. 408,541. Nov. 10, 1942.

Salt Grained by Injecting Brine Spray Tangentially Into Shallow Cylindrical Top of Grainer Having Downwardly Tapered Discharge Portion—Clinton S. Robison, Chicago, Ill., to Goderich Salt Co., Ltd., Goderich, Ontario. No. 409,215. Dec. 8, 1942.

Confections Chocolate Coated While Moving On Endless Conveyor Past Dipping Stations Where Molded Centers Taken From Trays Are Dipped Into Coating Composition and Replaced on Conveyor—Kenneth A. Rodgers, to Walter M. Lowney Co., Ltd., Montreal, Quebec. No. 409,490. Dec. 22, 1942.

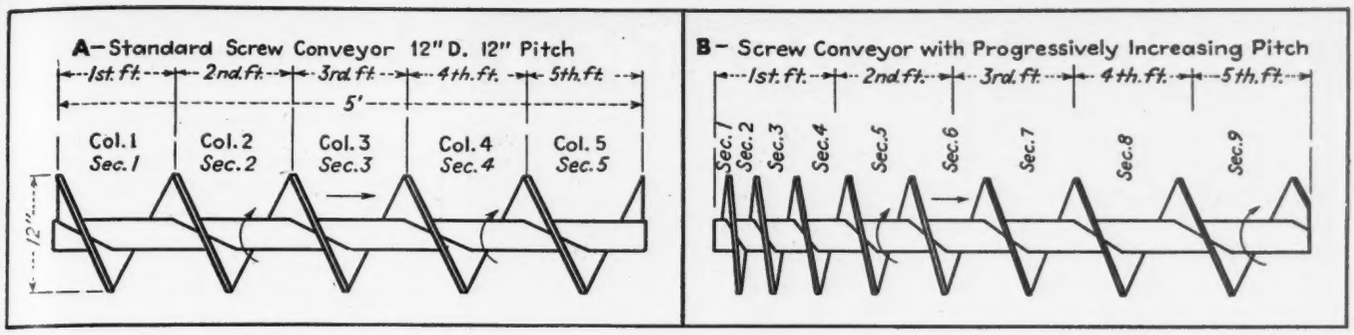


FIG. 4. Standard screw conveyor (A) and variable-pitch conveyor (B). The latter is the more satisfactory.

Bulk Storage and Blending And Quality Control

(*Continued from page 71*)

At best, the drawing out of the flour is troublesome unless considerable care is taken in the design of the apparatus installed for the purpose. To minimize the chances of bridging, the outlets cannot be contracted too much from the cross-sectional area of the bins. With bins approximately 8 ft. square hoppers from two sides ordinarily lead to openings about 60x18 in. The hoppers are angled at 70 deg. from the horizontal. With bins about 5 ft. square or 60 in. in diameter, the rectangular opening is usually about 14x28 in. In either case the opening is arranged to carry into the top of a conveyor box.

Conveyor as Percentage Feeder

With the larger bins a 12-in. conveyor is favored. It is equipped with a variable-speed mechanism, customarily with a ratchet movement, and in that way acts as a percentage feeder discharging, with others, into a common conveyor serving a number of bins. In turn, the long conveyor discharges either into an elevator leading to packing-out rebolting sifters or to one delivering to distributor conveyors over the tops of the bins. This latter arrangement is used when movement of flour from certain bins to other bins is desirable for blending or any other purpose.

Of all the troubles encountered in connection with large-scale bulk flour storage, those concerned with the drawing of flour from the bins have undoubtedly been the most serious. Condensation contributes largely to those difficulties, but even when that does not enter into the problem other factors do. Many thousands of dollars were lost by reason of unsatisfactory withdrawal devices before a real solution was found.

As has been explained, the conveyor beneath the bin is, in effect, the bin bottom to the extent of the rectangular area corresponding to the length-and-breadth dimensions of the conveyor, as illustrated in Fig. 5. When a 12-in. conveyor with a 12-in. pitch is used, the effective area is approximately 5 ft. long by 1 ft. wide. Each square foot will correspond to the base of a column of flour 1 ft. square and of a height equal to the height of the flour in the bin. At rest, the five sections of the conveyor will be filled by the bases of five columns of flour each 1 ft. square, as shown in Fig. 4 at A.

It is plain that if columns 2, 3, 4 and 5 were cut off, the conventional conveyor can receive a full load from column 1. When there is no cut-off, the flour originally in section 1 moves progressively into sections 2, 3, 4 and 5, interfering with the drawing down of the columns above. Conveyors are not, of course, 100 per cent efficient, and in practice the feed from column 1 is evidently slowed up to some extent by the entry of material from the other column. But in any event, in operation a conventional conveyor has been found incapable of drawing flour evenly.

A variable-pitch conveyor, as suggested in Fig. 4 at *B*, is now used successfully to obviate this difficulty. It is easy to see that the flour moved from section 1 into section 2 (and so on for the length of the screw) leaves room for flour coming down from the bin. And when the conveyor is correctly designed and placed under a hopper with sides having angles of not less than 70

An "Extra Hand"

Are you working short-handed? Then use this real time saver—quick-action Metso Cleaner. Metso cuts into grease without delay and suspends it. When the grease is removed, Metso whisks it away.

Users of Metso who clock cleaning operations cut minutes off each operation. And Metso's efficiency also reduces supervising time. Here's a new helper for your clean-up crew that is always dependable. Let us send you a sample to compare the results with your present method.

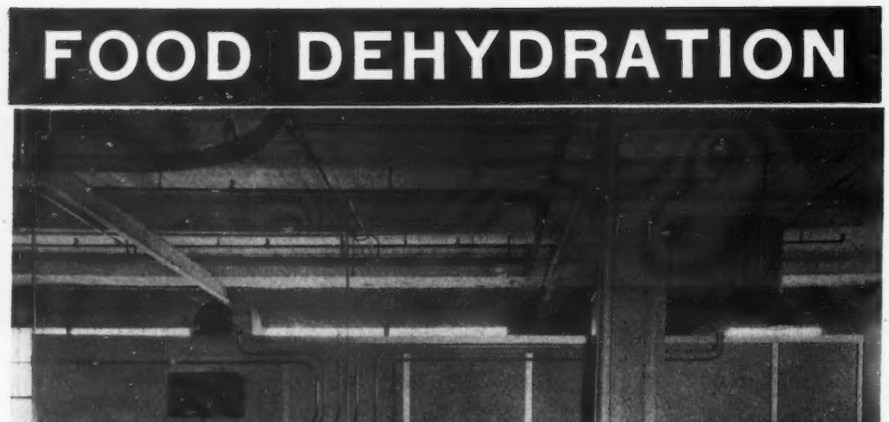
Sodium Metasilicate U. S. Pat. 1898707

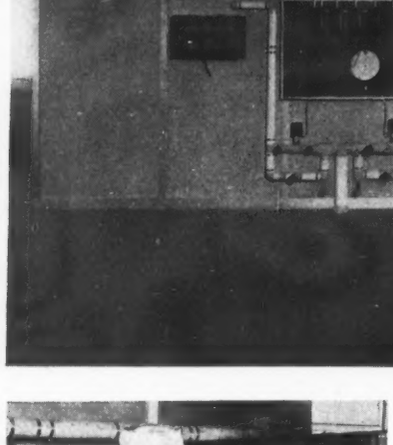
PHILADELPHIA QUARTZ COMPANY

Gen'l Offices: 125 S. Third St., Phila., Pa. • Chicago Sales Off.: 205 W. Wacker Dr.
Sold in Canada by National Silicates, Ltd. • Distributors in over 60 Cities

METSO CLEANERS

FOOD DEHYDRATION





You Can Maintain YOUR PRODUCTION By Getting Started With DEHYDRATION

YOU can maintain your production by gtting started with dehydration now . . . in spite of tin shortages and other restrictions. Now is the time to investigate . . . to promptly decide and get started in dehydration . . . to build your foundation for leadership in the rapidly expanding field of dehydrated foods . . . to help the war effort by helping to fill Government needs for hundreds of tons of dehydrated foods.

You Can Get Started Sooner With "Industaire"

"Industaire" Dehydrating Equipment has all the important features that give you exceptional efficiency in dehydration. Because they are made to a large extent of non-critical materials, we can design, build and install your "Industaire" Dehydrator NOW.

Investigate Now. Write us about your product and let's discuss the possibilities dehydration offers you. Send for detailed, illustrated bulletin, without obligation.

INDUSTRIAL AIR COMPANY

Westwood, Massachusetts

Dehydration Engineering and Equipment

deg. from the horizontal, a thoroughly satisfactory movement of product is assured.

Air Conditioning Needed

Modern bulk flour storage usually contemplates air conditioning—the control of the properties of the air within the building in respect to its temperature, moisture content and purity. Without question the air coming in contact with the flour during rebolting and packing out should be thoroughly cleaned. And unless it is also conditioned with respect to its content of water vapor in ratio to its temperature, moisture losses are likely to occur. However, the only conditioning essential to the prevention of conditions which will cause condensation on the inner surfaces of the bins, with its attendant troubles, is temperature control. The

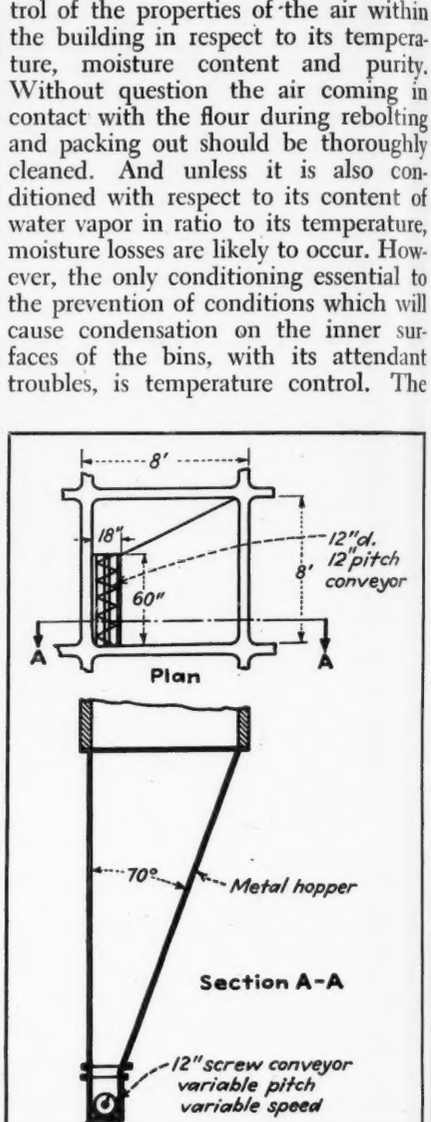


FIG. 5. Sketch illustrating how conveyor beneath bin is, in effect, the bin bottom.

dew-point temperature of the air within the bins is fixed by the temperature and moisture content of the flour. Once fixed, this temperature remains fixed until such time as condensation occurs, if it does occur.

The walls of the bins must be kept at a temperature higher than this original dew point if there is to be no condensation in the bins. But all that is required to assure this is the distribution of air around the bins with a temperature high enough to warm the walls. Theoretically, the heated air can be bone dry, so long as its temperature is such that it can keep the temperature of the walls above the dew point of the air within the bins.

Protection Against Insects

Well-designed and constructed bins of the type described can be made insect proof, except for insect life entering with the flour. But while the bins may empty cleanly, conveyors and elevators seldom, if ever, do. In some instances rebolting, as suggested in Fig 5, is relied upon to remove insect eggs and, of course, all life in a later stage of development. The removals are destroyed by fumigation or burning. In some instances mechanical devices capable of destroying even the eggs are installed, preferably directly above the bins, to insure against insect migrations capable of infesting intervening conveyors or elevators.

Bulk storage correctly designed and built is ideally adapted also to insect elimination and control through the use of approved insecticides of the lethal-gas type.

The tightness of the structures permits high gas concentrations without wastage. And temperatures favorable to complete destruction can be maintained throughout the operations by the equipment provided for heating the building and bins.

Army Specifications For Dehydrated Foods

(*Continued from page 53*)

22-42, "Supplies, Subsistence, for the United States Army, Conditions Governing the Purchase of."

U. S. Army Specification No. 100-2, "Standard Specifications for Marking Shipments."

Quartermaster Corps Tentative Specifications OQMG No. 12-a, "Packing for Overseas Shipment."

General Requirements

The domestic Swiss cheese used for dehydration shall score at least 92 points, based on the following factors: Body and texture, 45; flavor, 45; and salt, 10. The body shall be firm and meaty and mellow cured.

Eye development may be faulty or lacking but the cheese shall not be spongy or unnaturally gassy. The body may be glaesler. The flavor shall be characteristic of mellow cured Swiss cheese and shall be clean and pleasing. The salt shall be fairly uniform.

Dehydrated cream of Swiss cheese soup shall be prepared under sanitary conditions and in accordance with best commercial practice. The finished product shall be free from impurities. All deliveries shall conform, in every respect, to the provisions of the Federal Food Drug and Cosmetic Act, and regulations promulgated thereunder.

Detail Requirements

Dehydrated cream of Swiss cheese soup shall be composed of the following ingredients in the proportions by weight indicated:

Ingredient	Parts by weight (percent)
Swiss cheese, dehydrated	7–8
Milk, whole, dry, powdered (spray process)	3–4
Flour, potato	3–4
Flour, oat	3–4
Flour, soya	2–3
Flavoring ingredients; dehydrated vegetables or vegetable powder, such as onion, celery, parsley; vegetable protein derivatives: salt	2

The product shall be so precooked as to permit proper preparation by boiling in water for five minutes or less. The dehydrated domestic Swiss cheese used shall be processed from cheese complying with the provisions of paragraphs C-1 and C-2 of Federal Specification C-C-301. The dry, powdered milk used shall comply with Federal Specification C-M-351. The oat and potato flours each shall be of the best grade obtainable, and the soya flour, of a fat solvent type, shall be of the best grade obtainable. The dehydrated vegetables or vegetable powder used shall be prepared in accordance with Quartermaster Corps Tentative Specifications covering such products. The vegetable protein derivatives shall be of high quality and free from all harmful or deleterious ingredients. The salt used shall comply with Federal Specifications SS-S-31, Type A. The product and the packages shall be free from insect infestation.

The dehydrated product shall be free from bitter, burnt, musty, rancid and other undesirable flavors and odors. The moisture content of the dehydrated product shall not exceed 5 percent by weight. The dehydrated product shall be free from mold,

An Authoritative Booklet

. . . illustrating and describing the latest developments in testing and control equipment for all conditions of temperature, humidity and vacuum.

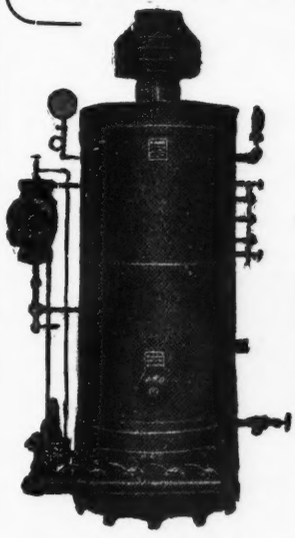
High Altitude Chambers
Constant and Variable Temperature Baths
Humidity Chambers
All-Weather Rooms

Engineering specifications for more than eighty installations are shown in this Booklet that will be mailed to you on request. Please address Dept. F-3.

TEN NEY ENGINEERING INC.

TENNEY ENGINEERING, INC.
8 Elm Street Montclair, N. J.

Processes that call for MAXIMUM CLEANLINESS and PRECISE TEMPERATURE CONTROL
call for
KANE
Automatic Gas-Fired
STEAM BOILERS



Being *gas-fired,* Kane Boilers are "tops" in cleanliness, efficiency and responsiveness to automatic controls. Their patented *double diaphragm* gas control can be set to maintain any desired operating pressure—assuring dependable, even heat transfer for critical processes.

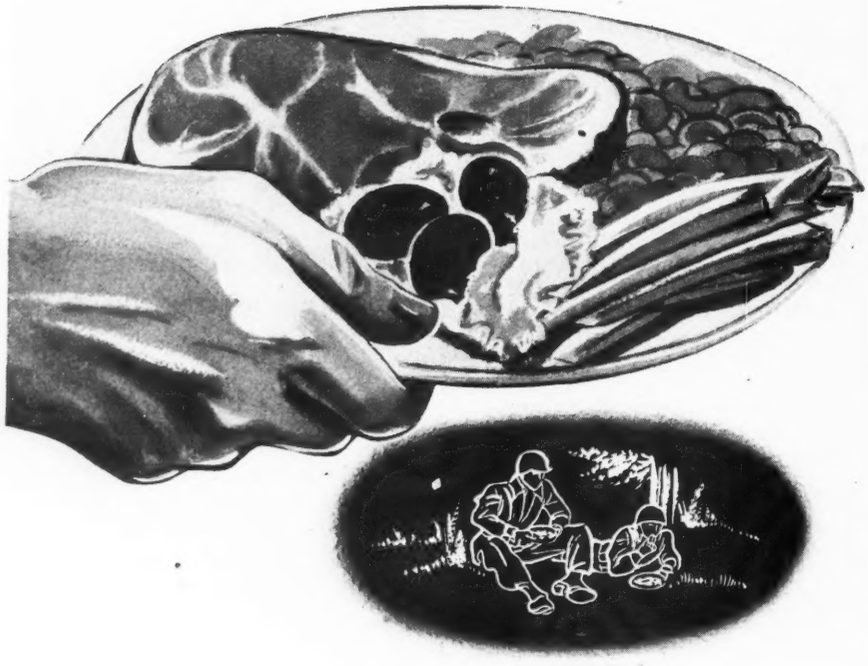
M-K-O BOILER FEED & RETURN SYSTEM helps maintain even steam pressure by automatically pumping required make-up water into boiler along with hot condensate. Water is always kept at proper level for highest boiler efficiency.

MEARS-KANE-OFELDT INC

Manufacturers of Automatic Steam Boilers for over a third of a century

1903-1915 E. Hagert St., Philadelphia, Pa.

FOOD is a Weapon . . .



. . .and REFRIGERATION makes it Mighty!

in 1830 . . .

lack of Refrigeration and transportation started a New York newspaper on a campaign to *forbid* city children from eating fruits and vegetables. . . . Then the City Council, struggling with a serious epidemic of Cholera, *prohibited the sale of fresh fruit to anybody.*

That's a far cry from our present National Nutrition Program! Modern Refrigeration made the BIG difference and helped build a more vigorous and healthy nation.

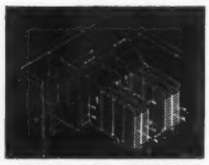
Today, the responsibility of Vilter Refrigeration is WORLD-WIDE. Food is a "Weapon," for tanks, guns, planes, ammunition could not be MADE—nor USED to win battles—without the energy, strength and spirit of well-fed armies of men in factories and on battlefields.

To the effective protection of this prime "Weapon of Victory" Vilter Refrigeration Engineers have dedicated their every effort—today, as in years past . . . in addition to our record breaking production of armaments.

VILTER

FRIGID BLAST FREEZERS

One of the newest, fastest and most economical of all modern methods of Freezing. Below, Type B Unit with open-end trucks moved against the FRIGID BLAST Blower.



WRITE FOR DETAILS on the VILTER FRIGID BLAST FREEZER—and for assistance on all your Refrigeration needs.

THE VILTER MFG. CO.
2115 South First Street
Milwaukee, Wisconsin
Offices in Principal Cities

Superior Since 1867 VILTER Refrigeration . . . Air Conditioning

ARMY (E) NAVY

ARMY-NAVY "E"
For Excellence: Awarded to VILTER for outstanding achievement in War Production.

grit, fillers, chemical preservatives, artificial colorings or foreign materials.

Inspection shall be made at point of origin, unless otherwise specified. Moisture determination shall be made by the vacuum-oven method by heating 2 grams of the product at 70 deg. C. to constant weight (approximately 6 hours) in a partial vacuum having a pressure of 100 mm. or less of mercury.

Domestic—Unless otherwise specified, commercial packaging is acceptable under this specification.

Export—Unless otherwise specified, the dehydrated cream of Swiss cheese soup shall be packaged in number 10 hermetically sealed sanitary cans or in metal cans of approximately 1 gal. capacity, equipped with double tight or triple tight friction plugs, which shall be spot soldered or spot welded in place after filling at three or more points equally spaced on the perimeter.

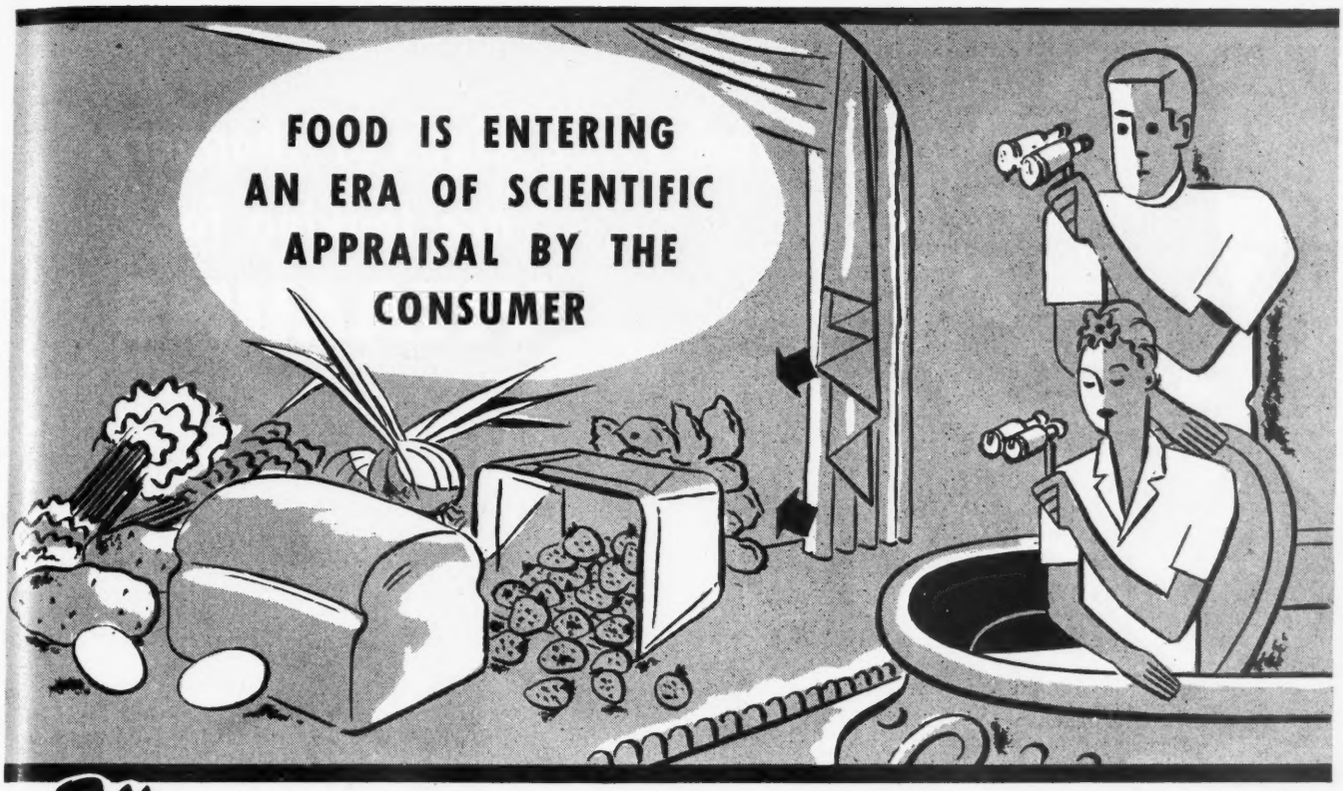
The metal cans shall be of the following construction: (a) Body of hot dipped tinplate (107-lb. plate with 1.25-lb. tin coating per base box) with ends of chemically treated backplate or electrolytic tinplate (107-lb. plate with not more than 0.5-lb. tin coating per base box), body seam to be soldered, top and bottom seams to be compounded or soldered, outer surfaces of the ends protected against corrosion by the application of a corrosion-resistant coating of lacquer or enamel. (b) Body of electrolytic tinplate (107-lb. plate with not more than 0.5-lb. tin coating per base box) with ends of chemically treated steel, body seam to be soldered, top and bottom seams to be compounded or soldered, the ends enameled on both sides. (c) Body and ends of electrolytic tinplate (107-lb. plate with not more than 0.5-lb. tin coating per base box), body seam to be soldered, top and bottom seams to be compounded or soldered, all outer surfaces protected against corrosion by the application of corrosion resistant coating of lacquer or enamel.

Each package or can shall bear printing or a label which, in addition to the label requirements of the Federal Food, Drug, and Cosmetic Act, shall contain necessary directions for preparation with reference to serving yield for entire package contents as well as directions for preparation by the individual serving.

Domestic—Unless otherwise specified, the product shall be delivered in standard commercial containers, so constructed as to insure acceptance by common or other carriers, for safe transportation, at the lowest rate, to the point of delivery.

Export—Unless otherwise specified, the product shall be packed in nailed wooden boxes complying with Quartermaster Corps Tentative Specification OQMG No. 12-A. All strap iron and wire bands shall be securely fastened and the ends cut off or secured to prevent injury to clothing or hands. Packages shall be packed six to the case.

Marking—Unless otherwise specified, shipping containers shall be marked with the name and type of product, the net weight of the product, the gross weight of and volume occupied by the container, the date of processing, the name of the contractor, the number of the contract or order, and date of packaging. Ink used in marking containers shall take on wood or fiber and shall be waterfast and sunfast.



What are you doing to prepare for the coming changes?

Every open-minded, clear-thinking food manufacturer knows that, in the world of tomorrow, consumers will buy foods scientifically. On a vitamin basis. On a purity basis. On a nutritive basis.

What are you doing to prepare your food products for this new type of demand? How will this demand affect your labelling, your advertising, your merchandising? What changes, if any, will it require in your manufacturing processes, your packaging? How will it affect the physical form of your foodstuffs? How will it influence your costs, your selling price, retail mark-up?

Our Foodstuffs Planning Board is working on these and many other problems with industry leaders. Each survey is made to meet the specific problems of the organization with which the Board is working . . . the solutions worked out are "tailor-made" to the individual case studied.

Backing our Foodstuffs Planning Board, in its surveys of the world to come, is a vast assemblage of scientific equipment for the following scientific tests:

- VITAMIN ASSAYS
- PREVENTION OF VITAMIN LOSS IN FOODS AFTER PROCESSING
- PREVENTION OF VITAMIN LOSSES DUE TO PACKAGING
- DETERMINING TOXICITY OF PACKAGES, INCLUDING BEVERAGE CAN LINERS, PLASTICS, ETC.
- PURITY TESTS CONFORMING WITH THE PURE FOOD AND DRUG LAWS

* Member of A. C. C. L.

If you are interested in planning for future markets...write to our Planning Board now.

UNITED STATES TESTING COMPANY, INC.

ESTABLISHED 1880

HOBOKEN, NEW JERSEY

PHILADELPHIA, PA. GREENSBORO, N. C. WOONSOCKET, R. I. CHICAGO, ILL. NEW YORK, N. Y.

*American Council of Commercial Laboratories

That's why SALES OF ENRICHED FOODS ARE GOING up and up!

Not only to meet the demands of America's 32 million housewives, but to make your products more important in the war effort . . . *it pays to enrich now!*

Up until now, food manufacturers who enriched their products have quickly found the keen interest of America's housewives in the vitamin content of foods has made enrichment one of the wisest business moves they could make.

But today a new shopper enters the market—*Uncle Sam!* For not only the civilian population must be fed—*and well fed*—but the Army, Navy and Lend-Lease must be well fed, too!

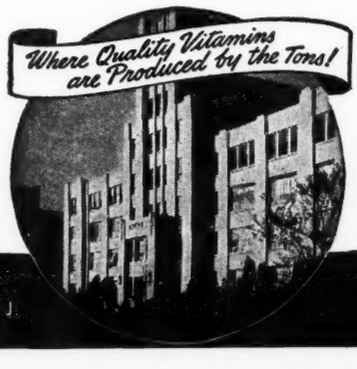
It's doubly important, therefore, that your products carry the highest nutritional rating. *That means high vitamin content.*

So if your products have lost vitamins in processing, give serious thought to enriching.

You know what enriching has done for the sales of white bread, family flour, cereals, etc. And you know the emphasis Uncle Sam is putting on these foods today!

With this double incentive, plus the fact that enriching costs are down to a mere fraction of what they used to be, it will pay you to find out now which of your products, in the eyes of nutritional authorities, should be enriched.

We will gladly advise you and give full technical information—how to enrich, the new low costs and the many benefits to you. We pioneered in vitamins and today are furnishing a goodly percentage of the nation's vitamins B_1, B_2, C and niacin requirements. Write us for the latest sales-enriching vitamin facts today.



Hoffmann-La Roche, Inc. VITAMIN DIVISION ROCHE PARK · NUTLEY · N. J.

FOOD TECHNOLOGY

NEW DISCOVERIES AND INVENTIONS

VITAMINS

Thiamin and Riboflavin In Wheat Germ

WHEAT germ embryo contains about 4 I.U. of vitamin B_1 per gram, whereas the scutellum is much richer, probably near 40 I.U. per gram. Careful dissection tests of English wheat revealed that the scutellum outweighs the embryo, comprising 1.5 percent of the wheat berry as against 1.2 percent for the embryo. Dry milling as now practiced in England, in making 85 percent extraction flour, does not remove the scutellum efficiently. The yield of wheat germ is thereby impaired both in amount and in thiamin concentration. Hence the white flour produced by the process is correspondingly enriched in thiamin. The scutellum and embryo of the wheat germ are about equal in riboflavin content. One kilogram of either contains about 15 mg. of riboflavin.

Digest from "Vitamin B_1 and Riboflavin Contents of Wheat Germ," by J. J. C. Hinton, *Journal of the Society of Chemical Industry*, vol. 61, 143, 1942 (Published in England).

FATS AND OILS

Stabilization of Fats

ANTIOXIDANTS of recognized value in delaying or inhibiting the rancidity of refined fats, oils, and similar food products are reviewed. Materials naturally occurring with food products have been preferred for stabilizers, because of the improbability of toxic effects. A number of chemically distinct types have been found effective in different food fats, and certain combinations of antioxidants, notably gum guaiac and phosphoric acid, give greater protection than either one alone.

For preventing development of rancidity in meat food fats, particularly lard, and for stabilization of baked products made therefrom, gum guaiac has been investigated extensively. This product, indigenous to Central America and the West Indies, apparently does not occur naturally with food materials. Tests have proved its lack of toxic effect. The authors report it to be a practical and effective stabilizer for lard, now in commercial use.

Incorporation of this antioxidant into paper liners for lard and shortening cartons appreciably retards development of rancidity in the fat absorbed by the liner, increasing the period before development of rancidity from 3 months to 6 months at 75 deg. F.

Digest from "Stabilization of Fats and Fatty Foods," by H. S. Mitchell and H. C. Black, *Industrial and Engineering Chemistry*, vol. 35, 50-52, January, 1943.

DAIRY PRODUCTS

Canned and Powdered Milk

CANNED and dried milk, properly prepared, retain the full nutritional value of fresh milk. This is especially true of the sweetened products. Even vitamin C, in spite of its sensitivity, is retained by the best modern methods. Uniform composition, freedom from pathogenic organisms and fine casein dispersion make canned and dried milk products more digestible than fresh milk. This is an important advantage in diets for infants and invalids. With gastric juice, homogenized canned milk yields a coaglum which is quite as finely dispersed as that of human milk, whereas fresh cow milk yields a lumpy, difficulty digestible curd. Leucocytosis by the Kuchakov method shows the same characteristics for milk powder as for canned milk. So does the Pfeiffer crystallization test. Special milks are helpful in gastric disease and in other disorders. A leading example is dechloridized canned milk for patients with certain renal and cardiac diseases. The four grades of sweetened milk powder, namely skimmed, partially skimmed, whole and acidified whole milk, add greatly to the versatility of dried milk as an accessory in special diets.

Digest from "Preserved Milks in the Wartime Food Supply," by M. Guigoz and A. Jaton, *Schweizerische medizinische Wochenschrift*, vol. 72, 970, 1942 (Published in Switzerland).

Further Studies on Oxidized Flavor in Milk

CREAM was washed until practically all of the milk plasma solids were removed. The washed cream thus obtained was used to determine the role of several possible agents in the development of oxidized flavor.

Addition of copper did not produce an oxidized flavor when the cream was stored three days at 35 to 45 deg. F. Similar cream to which ascorbic acid or glutathione had been added did develop oxidized flavor when contaminated with copper. Ascorbic acid additions in the range from 40 to 100 mg. per liter gave the strongest flavor. With 21 mg. per liter the development of oxidized flavor was erratic, and with a high concentration, 630 mg. per liter, there was no development of the oxidized flavor.

The occurrence of hydrogen peroxide was suggested in these reactions, and it was found that addition of 0.10 percent hydrogen peroxide caused development of the oxidized flavor in copper contaminated washed cream.

Under the conditions of these experiments thiamin, pyridoxine, riboflavin and cysteine did not produce oxidized flavor in the presence of copper.

The protective factor in nonsusceptible milk is in the water phase, since it was found possible to develop an oxidized flavor in washed cream from normally nonsusceptible milk.

Digest from "Oxidized Flavor in Milk. XI. Ascorbic Acid, Glutathione, and Hydrogen Peroxide as Mechanisms for the Production of Oxidized Flavor," by F. C. Olson and W. C. Brown, *Journal of Dairy Science*, vol. 25, 1027–39, December, 1942.

BACTERIOLOGY

Bacteriological Study Of Apple Juice

PROCESSING of apple juice was carried out experimentally in equipment approximating that of commercial canneries. Bacteriological tests were made of the apparatus and of the product at various stages during processing.

The apples are not an important source of contamination. Washing reduces the number of organisms on the apples, but there is only a slight difference between washing with dilute hydrochloric acid or with water. Paraffine lined wooden equipment, such as tanks and barrels, introduces serious contamination, even after rinsing with strong hypochlorite solution followed by water. An aluminum filter constructed so that it could not be readily cleaned was heavily contaminated after being in use for two months. Filtration through heavy filter paper reduced the contamination, and clarification by filtering through diatomaceous earth was

very effective, as indicated by a reduction of 99.9 percent in the number of organisms present after filtration.

Insanitation, due to the use of unwashed cans for pasteurized juice, caused the juice to spoil in the cans when stored two weeks at room temperature.

Flash pasteurization at 175 deg. F. for 7 to 10 seconds under a steam pressure of 10 lb. per square inch, was effective. Rapid cooling is not necessary, provided pasteurization has been properly carried out.

Preliminary experiments indicated that freezing of the juice causes a rapid decrease in the number of organisms, particularly during the early period. Juice from the cider tank containing 1,788,000 organisms per cubic centimeter had only 426,000 after 7 days and 1,320 after 27 days. Cocci were much more persistent than yeasts or rod-shaped bacteria.

Digest from "A Microbiological Analysis of Apple Juice Processing," by J. Forgacs, *Food Research* vol. 7, 442-50, December, 1942.

Fumigation of Fungi and Bacteria

RESISTANCE of plants to hydrogen cyanide is dependent on their slow rate of metabolic activity. In low concentrations the effect of hydrogen cyanide on the fungi and bacteria is slight, in spite of their higher rate of respiration. This is explained by the fact that with sulphur, which these plants contain in considerable amounts, hydrogen cyanide may be rapidly converted into harmless compounds.

Higher concentrations of hydrogen cyanide can be lethal to both colonies and spores of molds and bacteria. In a greenhouse fumigation 2.6 percent of hydrogen cyanide by volume was used, during a 50-hour period. The rooms involved were very dusty. Tests before fumigation showed active fungal and bacterial growth on malt agar Petri plates exposed in various locations. Fresh sterile plates exposed after the fumigation remained sterile, and inoculated plates which had been exposed to the fumigating vapors showed no further growth on incubation. The plates which had been exposed to the vapors inhibited growth for about eight days, but after ten days slight growth occurred from fresh inoculations.

It is suggested that this method has possibilities of useful application, if further investigations show that it is possible to inhibit the growth of destructive saprophytic organisms for a period of one or two weeks when rooms and their contents have been wetted after bombings, fire, or accidents. A probable advantage of hydrogen cyanide in such situations is that, in general, bacterial growth is checked by very dilute solutions, residual traces are persistent, and it is very penetrating. It may not act on anaerobes which lack cytochrome components.

Digest from "High-concentration Hydrogen Cyanide Fumigation of Fungi and Bacteria," by Dr. N. Polunin, *Nature*, vol. 150, 682–3, December 12, 1942.

SUGAR

Sugar Mixture

FONDANTS, cake icings and other sugar products which must remain moist and smooth for some time, can be prepared readily by addition of water to a special mixture of crystalline sucrose and non-crystallizable sugars.

Sucrose finely crystallized, so as to pass a 250- or even 300-mesh Tyler screen, is treated with up to 30 percent of invert sugar in the form of a fine spray, applied while the sugar is being constantly mixed. The mixture when finished will appear very little changed from the original crystalline condition. Each of the invert globules will be surrounded or enveloped in sucrose particles adhering to it, so that the product is not sticky. The powder is free flowing under all normal conditions. It can be packaged without difficulty.

Anhydrous or hydrated dextrose or lactose of suitable crystal size can be substituted for all or part of the sucrose, and corn sirup, levulose or maltose can be employed in place of the invert sugar.

Digest from U. S. Patent 2,299,287, issued October 20, 1942, to Robert Whymper, and assigned to The National Sugar Refining Co., Edgewater, N. J.

FROZEN FOODS

Glazing in Quick Freezing

THE value of the various moisture-vapor proof sheets used in packaging frozen foods is dependent upon resistance to the passage of water vapor at low temperatures. If materials meeting the exacting standards for this use become scarce or unobtainable, it is suggested that "glazing" of the frozen product itself may offer a solution to the problem of preventing dehydration during storage.

For a long time fish frozen at low temperature have been glazed by dipping in water a sufficient number of times to allow formation of a film of ice. So treated, they can be kept in low-temperature storage rooms without packaging.

Preliminary experiments have shown

SCIENCE AT YOUR SERVICE

Food problems multiply in war-time. New ingredients, new formulas, new processes, new packaging—vitamin retention, control, and enrichment.

We have had more than twenty years experience on such investigations for clients whose names read like the Who's Who of the Food Industry.

The facilities of our organization are described in a new brochure entitled "SCIENCE AT YOUR SERVICE" which will be sent to food executives upon request.

FOOD RESEARCH LABORATORIES, INC.
48-14 Thirty-Third St., Long Island City, N.Y.
Over 20 years' service to industry

that in the case of other frozen foods it is entirely feasible to develop a waterproof and moistureproof glaze, such as a mixture of fats, oils and waxes. An example of this method exists on the market in the form of coated ice cream bars.

Suitable mixtures of waxes, fatty materials, paraffins, resinous materials and synthetic compounds, insoluble in water and capable of preventing the passage of water vapor, could be developed.

A product having the proper physical characteristics, forming a continuous film about the frozen food, should maintain food value and quality over a long period of time. The film could be peeled off after exposure of the package to room temperature. Or the frozen food could be put in a muslin or paper wrapper and dipped in the moisture-proofing mixture.

It is believed that the method is practical, because no special equipment is necessary, it is space saving, light and economical, and particularly advantageous for the protection of irregularly shaped cuts of frozen meats and poultry.

Digest from "Packaging of Frozen Foods Under War Conditions," by H. C. Diehl and W. Rabak, *1942 Proceedings, Institute of Food Technologists*, 117-20, June, 1942.

CEREAL PRODUCTS

Effect of Storage On Corn Proteins

THE results of these studies, undertaken by the Bureau of Protein and Nutrition Division, U. S. Department of Agriculture, show three significant types of changes in the proteins of stored ground and whole dried shelled corn; a marked decrease in the solubility of the protein, a progressive breakdown of the proteins as indicated by a decrease in true protein content, and a decrease in digestibility.

Samples were stored in airtight glass jars and in closely woven cotton bags, kept in dark cupboards in rooms maintained at 76 deg. and 30 deg. F., with about 55 percent relative humidity. Determinations were made at intervals over a period of two years.

There was no visible indication of spoilage or deterioration of the material, and no evidence of mold or insect infestation. All of the changes were greater in the ground corn than in the whole shelled corn. Samples stored at 76 deg. F. were affected more than those stored at 30 deg., and samples stored in bags showed greater changes than those in the airtight glass jars. At the end of two years under the least favorable storage conditions, ground corn in bags at 76 deg. F., denaturation had taken place to an extent indicated by a loss of 60 percent in the solubility of the protein in sodium chloride solution and in alcohol. True protein value decreased 32 percent and digestibility 29 percent. The changes occurred much more rapidly during the early periods of storage.

Feeding tests on rats showed a loss in feeding value which ran closely parallel to the chemical changes, although the nature of these chemical changes throws very little, if any, light on the loss of growth-promoting value. The gain in weight per gram of food consumed and the amount of food taken both decreased after storage.

Digest from "The Effect of Storage of Corn on the Chemical Properties of Its Proteins and on Its Growth-Promoting Value," by D. B. Jones, J. P. Divine, and C. E. F. Gersdorff, *Cereal Chemistry*, vol. 19, 819-29, November, 1942.

MISCELLANEOUS

Monosodium Glutamate

THIS patent covers an improved method for crystallizing monosodium glutamate, in order to avoid caking and dusting or discoloration of the product.

Glutamic acid is prepared in the usual way, by hydrochloric acid hydrolysis of corn or wheat glutens. This acid must not contain more than 10 percent of mother liquor solids, because these seriously interfere with crystallization of the monosodium glutamate. Dry crude glutamic acid is added to a 13 percent caustic soda solution, then the solution is treated with decolorizing carbon and filtered.

The improvement covered by the patent consists in precipitating the monosodium glutamate from this filtrate by gradual addition of anhydrous ethanol at a controlled rate, so that the solution is maintained during the entire precipitation in a predetermined supersaturated condition with regard to the monosodium glutamate. Precipitation is carried out in the temperature range of 20 to 50 deg. C., preferably 30 to 40 deg. C., and at a pH such that a sample diluted tenfold with water will lie within the range of 5.7 to 6.8. The addition of the alcohol must be continued for at least 12 hours. Methanol or isopropanol can be substituted for part or all of the ethanol.

The precipitate is washed with ethanol.

It is claimed that the dry product is white, odorless, free-flowing, dustless, with a grain size between 100 and 150 mesh.

Digest from U. S. Patent 2,306,646, issued December 29, 1942, to P. R. Shildneck, and assigned to A. E. Staley Manufacturing Co., Decatur, Ill.

For Savings Specify

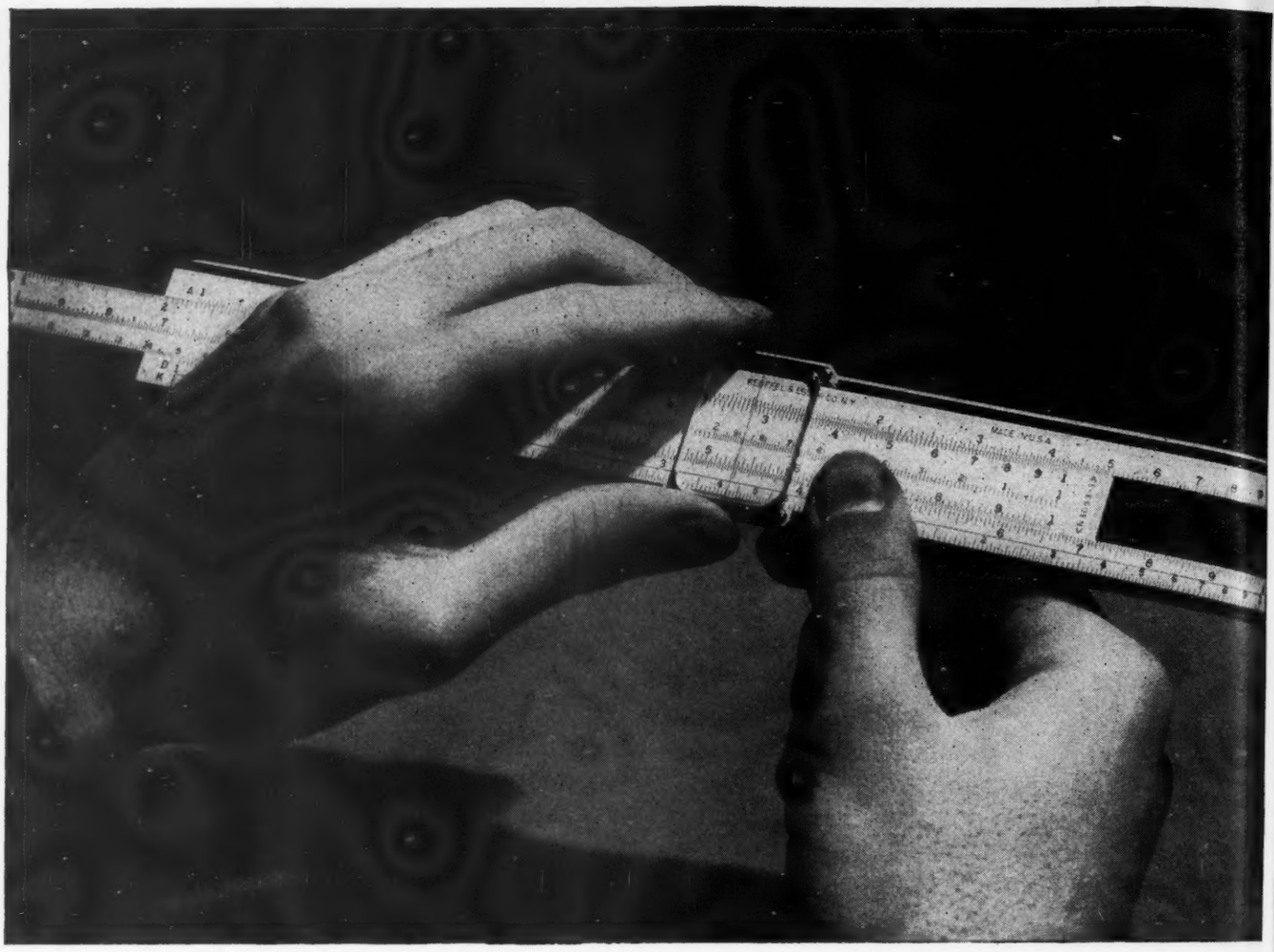
DARNELL CASTERS

• Save Money, Floors, Equipment and Time by using DARNELL Casters and Wheels . . . Always dependable.

DARNELL CORPORATION, LTD.

LONG BEACH, CALIF.
36 N. CLINTON, CHICAGO
60 WALKER ST., NEW YORK

A SAVING AT EVERY TURN



"You don't need to be an engineer"

NO ONE needs an engineering degree to know it takes more power to stop, and then start again, on a hill than it does to *keep going*.

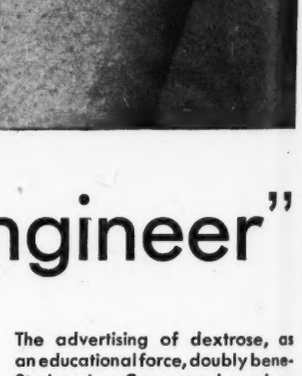
The advertising of dextrose is an educational force that now has momentum, that's moving ahead.

It's better to keep it going, despite the fact that demand exceeds supply, than to stop and have to start all over.

In the long run, the continued educational power of dextrose advertising will more quickly return all of us to normal business conditions by *keeping* people aware of its value as food-energy sugar.

CORN PRODUCTS SALES COMPANY
17 BATTERY PLACE, NEW YORK, N. Y.

The advertising of dextrose, as an educational force, doubly benefits America. Consumers learn how this pure white, crystalline food-energy sugar forestalls fatigue, fortifies energy. Asking for foods "Enriched with Dextrose", they increase the use of American corn, grown by American farmers, refined in American factories, distributed by American companies.



CERELOSE *is* DEXTROSE

TUNE IN

Stage Door Canteen

Every Thursday 9:30 to 10:00 P.M., E.W.T., Columbia Network, Coast-to-Coast

FORMULAS FOR FOODS

FORMULA NO. 387

Flaked Wheaten Bread

Sponge

First clear flour	55 lb.
Potato flour	5 lb.
Yeast	1½–2 lb.
Water, approximately	42 lb.
Yeast food (optional)	2 oz.
Malt (optional)	2 oz.

Directions

Yeast food must be used where the mineral condition of the water requires it. Use malt if the diastatic value of the flour is low.

The sponge when mixed should have a temperature of 76 deg. F. Fermentation time should be about 4 hours, and mixing time for the sponge 5 minutes.

Dough

Flaked or rolled wheat	15 lb.
Coarse whole-wheat flour	15 lb.
"First clear" flour	5 lb.
Potato flour	5 lb.
Sugar (granulated)	2 lb.
Salt	2¼ lb.
Water	25 lb.
Shortening	2 lb.
Fresh wheat germ	2 lb.

Directions

Cream wheat germ, shortening and 1 lb. of potato flour together before adding to the dough, so as to get a uniform dispersion of the wheat germ.

The temperature of the dough when mixed should be 79 deg. F. Allow 8 minutes mixing time and 15 minutes proof.

Formula from Rogers Bros. Food Products.

FORMULA NO. 388

Corsica Loaf

Fresh veal trimmings	50 lb.
Fresh hog livers	15 lb.
Fresh beef trimmings	30 lb.
Fresh pork backfat	5 lb.
Dry milk solids*	8 lb.
Salt	3 lb. 8 oz.
Nitrite of soda	¼ oz.
White pepper	7 oz.
Paprika	12 oz.
Garlic powder	1 oz.
Mace	2 oz.
Italian cheese	4 oz.
Tomato puree, No. 3 cans	2

*Not over 1¼ percent fat

Directions

Grind veal through a ⅛-in. plate; beef and livers through a ¼-in. plate. Place veal in silent cutter. While chopping add shaved ice, dry milk solids, salt, nitrite and spices.

When veal is nearly fine enough, put in beef, livers, and backfat, and chop just enough to give a cube effect from backfat.

Keep mix overnight to cure. Put in loaf containers, cook at 160 deg. F. for 3 hours or more, depending on size of container. Inside temperature must be 154 deg. F.

Chill and stuff in cellulose casing.

Formula from American Dry Milk Institute, Inc.

FORMULA NO. 389

Tomato and Cucumber Spread

Fresh tomatoes	40 lb.
Cucumbers	10 lb.
Salt	3 lb.
White pepper	2 oz.
Ground Jamaica ginger	1 oz.

Directions

Wash tomatoes and dip first in boiling water and then in cold water; drain and skin. Peal cucumbers and if large scoop out the seeds. Then cut up, boil until soft and drain.

Pass tomatoes through an 8-mesh sieve into a steam pan. Pass cucumber through same sieve into the pan.

Add the other ingredients and bring to boil, stirring all the time. Fill at not less than 180 deg. F.

Formula from H. B. Cronshaw, Surrey, England.

FORMULA NO. 390

Golden Oat Layer Cake

Cake flour	3 lb. 12 oz.
Margarine	1 lb. 14 oz.
Granulated sugar	3 lb.
Brown sugar	1 lb. 14 oz.
Baking powder	3¾ oz.
Cinnamon	¼ oz.
Nutmeg	¼ oz.
Salt	½ oz.
Milk	1 lb. 14 oz.
Whole eggs	2 lb. 4 oz.
Cooked oats	2 lb. 4 oz.

Directions

Cream cake flour, margarine, sugar, baking powder, spices, salt and 1-lb. of milk 3 minutes on low speed. Scrape bowl and paddle once.

Cook 1-lb. of oats and 1-oz. of salt in 5-lb. of boiling water for 1 minute. Add the cooked oats and the remainder of the ingredients all at once to the first mixture, and continue to mix 3 minutes. Bake at 375 deg. F.

Scale 7½ to 8½ oz. in 7-in. pans 1 in. deep, or 8½ to 9½ oz. for a 1½-in. depth. This batch makes approximately 32 layers weighing 8½ oz. or 28 layers weighing 9½ oz.

Formula from Swift & Co.

FORMULA NO. 391

Filbert Filling For Coffee Cake

Granulated sugar	5 lb.
Cake crumbs	8 lb.
Cinnamon	1 oz.
Whole eggs	14 oz.
Toasted ground filberts	2 lb.
Milk	3 lb. 8 oz.

Directions

Mix the sugar, cake crumbs and cinnamon, then add the eggs and the ground nuts. The milk may be varied somewhat, to give a smooth mixture.

Formula from Swift & Co.

FORMULA NO. 392

Concentrated Chili

Fresh beef*	65 lb.
Beef kidney suet	35 lb.
Garlic	2 oz.
Onions	5 lb.
Salt	2 lb. 8 oz.
Chili pepper	4 lb.
Paprika	1 lb. 8 oz.
Ground coriander	6 oz.
Origanum	3 oz.
Soya flour	7 lb.
Tomato puree	1 gal.

* Beef used in preparation must be free from sinews.

Directions

Grind the suet with the garlic and onions through a ⅜-in. plate. Cook in either a steam-jacketed or gas-fired kettle. Stir with a paddle until the onions and garlic are cooked to a light brown; then add the beef, which has been ground through the ⅜-in. plate, and the salt. Cook until the meat is tender and until all the water in the meat has evaporated. The mixture should be stirred at all times to keep it from adhering to the sides. About 15 to 20 minutes before the meat is fully cooked, add the spices.

Just before the finish of the cooking, turn the fire low and discontinue stirring for 5 minutes. This will allow the fat to come to the top. Then sift in the soya flour. After this has been dissolved and the fat has risen to the top, mix rapidly and thoroughly, then turn back to the stage where it was cut down and allow to cook for 15 minutes longer. Continue to stir to prevent sticking. To give a better flavor add the tomato puree.

MORE priceless than the treasures in spices which lured Marco Polo to strange lands are the concentrated SPICE AND FLAVOR OILS that come from the fabulous treasureland of today, the laboratory.

It is these concentrated ESSENTIAL FLAVORING AND SEASONING OILS, distilled from natural spices, that provide the users of flavor in industry with the perfect medium for scientific flavor control.

From the M M & R laboratories come an endless variety of such flavor oils as well as special formulae spice mixtures for everything from meat packs to pickles.

M M & R laboratory technicians offer their services to help find solutions to the multiplying flavoring problems that face industry during these exceptional times. This service is at your command.

MAGNUS,
MABEE & REYNARD, INC.
QUALITY ESSENTIAL OILS,
CONCENTRATED FLAVORS SINCE 1895
16 DESBROSSES ST. NEW YORK, N. Y.
221 N. LA SALLE ST. CHICAGO, ILL.

If condensed chili is to be stuffed into casings, remove the chili from the cooker and cool it to 150 deg. F.. Be sure that it is well stirred before placing in the stuffer. The casings should be stuffed with the chili in the same manner as is employed in stuffing sausages. A box truck filled with ice water should be kept near the stuffers. When the casings are tied after being stuffed, drop them in the ice water. This will set them immediately.

The chili may also be scaled off in tin loaf molds, and when cool, removed and wraped. Concentrated chili should be wrapped in parchment paper. If the precautions regarding cooking are heeded, the product when properly packed should keep for six months.

While it is customary only to use beef, some producers include a good grade tripe. If the tripe is used, it should constitute not more than 30 percent of the meat formula. The tripe is added to the meat about 25 minutes before it is fully cooked. This drives the color and seasoning through the tripe, which is ground through the same size plate as the beef and fat after it has been boiled and cooked.

Formula from Stein, Hall Mfg. Co.

FORMULA NO. 393

Butterscotch Sauce No. 2

Egg yolks	0.85 lb.
Butter	2.5 lb.
Corn sirup	5 lb.
Water	2.5 lb.
Brown sugar	5.6 lb.

Beat egg yolks slightly, add remaining ingredients and cook in steam-jacketed kettle, stirring frequently until a thick sirup forms.

FORMULA NO. 394

Lemon Cream Pie

(1)

Granulated sugar	1 lb.
Cornstarch	6 oz.
Egg yolks	8 oz.

(2)

Water	4 lb.
Granulated sugar	1 lb.
Salt	½ oz.
Lemon juice	10 oz.
Butter	4 oz.

Directions

Dry mix the first portion of sugar and cornstarch. Add the egg yolks and mix until smooth. Heat the water, the second portion of sugar, the salt, and the lemon juice until the solution reaches its boiling point. Pour a cup of the hot solution into the starch mixture and mix until smooth. Pour the starch mixture into the boiling solution, while stirring vigorously. As soon as the mixture begins to thicken, remove from the fire. Add the butter and stir until it is melted. Fill into prebaked shells at once. Cool.

Top with either meringue or whipped cream. Do not overcook.

Formula from Swift & Co.

FORMULA NO. 395

Chocolate-chip Cookies

Shortening (part butter)	1 lb.
Light brown sugar (sifted)	1 lb. 10 oz.
Whole eggs	8 oz.
Sour cream or buttermilk (variable)	6 oz.
Vanilla	5/16 oz.
Cookie flour	2 lb.
Soda (variable)	5/16 oz.
Salt	5/16 oz.
Nutmeats (chopped)	8 oz.
Semi-sweet chocolate (coarsely chipped)	14 oz.

Directions

Cream the shortening and sugar until light. Add the whole eggs and incorporate well. Mix in the sour cream or buttermilk and vanilla. Blend the flour, soda and salt by sifting. Add this mixture and the chopped nutmeats and chocolate to the above mixture and mix only enough to blend in. Deposit on lightly greased sheet pans and bake lightly.

Scale 4 to 5 oz. per dozen cookies.

Bake approximately 10 minutes at 375 deg. F.

Formula from General Mills, Inc.

FORMULA NO. 396

Nut-Fruit Cuts

Corn sirup	10 lb.
Enzyme-converted corn sirup	10 lb.
Hardened edible oil*	4 lb.
Sweetened condensed milk	5 lb.
Salt	4 oz.

*86 to 90 deg. F. melting point

Directions

Cook all together to about 236 deg. F. (medium soft ball) then add 50 lb. of dried fruit and nuts, which may be:

Black dried figs	5 lb.
Bleached dried figs	10 lb.
Prunes, pitted	5 lb.
Dates, pitted, broken or whole	10 lb.
Raisins	5 lb.
Dried apricots	5 lb.
Brazil nuts, whole or broken	10 lb.

The fruit and nuts should be warmed before adding to the sirup.

Turn the batch out on an oiled slab; form into sheets of the desired thickness. When cool, cut and wrap.

Formula from Nulomoline Co.

Analysis

• **Chas. Pfizer & Co., Inc. has always regarded the careful and intelligent examination of all products as not only a necessary but also an important part of its manufacturing processes. We believe that the uniformity and high purity of our products cannot be assured without thorough examination and that it involves more than just the routine checking of materials against certain specifications.**

The personnel of our Analytical Department is of the highest caliber and every effort has been made to make the most modern equipment available. Through thorough and careful analysis it has been possible for this department to make many suggestions which have resulted in improved products and improved methods of manufacture.

The research division of this department is constantly striving to improve or devise new techniques for the examination and analysis of our materials. New products, too, have always occasioned considerable analytical research, it often having been necessary to revise existing analytical methods to a great extent, or even to devise entirely new procedures. Needless to say, all of this would be impossible if analysis were considered to be merely a routine matter.

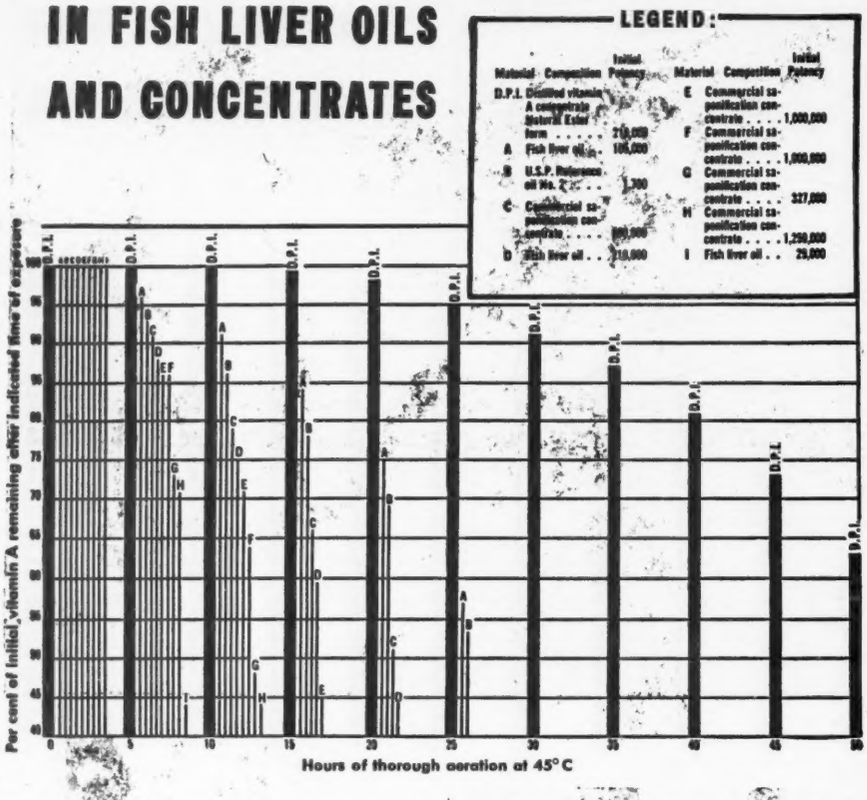
We feel that the reputation for dependability and high quality which our products enjoy is due in no small measure to our Analytical Department.

MANUFACTURING CHEMISTS • ESTABLISHED 1849

Chas. Pfizer & Co., Inc.

81 MAIDEN LANE, NEW YORK • 444 W. GRAND AVE., CHICAGO, ILL.

COMPARATIVE STABILITIES OF VITAMIN A IN FISH LIVER OILS AND CONCENTRATES


LEGEND:
Material
Composition
Initial Potency
D.P.I. Distilled vitamin A concentrate (Natural Ester form) 210,000
A Fish liver oil . . . 105,000
B U.S.P. Reference oil No. 2 . . . 1,360
C Commercial saponification concentrate 660,000
D Fish liver oil . . . 210,000
E Commercial saponification concentrate 1,000,000
F Commercial saponification concentrate 1,000,000
G Commercial saponification concentrate 327,000
H Commercial saponification concentrate 1,250,000
I Fish liver oil . . . 29,000
Per cent of Initial Vitamin A remaining after Indicated time of exposure
Hours of thorough aeration at 45° C

The very significant chart above is the recent version of the chart first published in "The Story of Vitamin A Esters," 1939 edition. The marked difference between the Distilled Esters and other materials obtained on the open market has been confirmed; indeed the difference has become even more pronounced due to continued improvement in the production of Vitamin A Esters.

For a comparative test of stability (resistance to oxidation by heat and air), a sample of standard Distilled Vitamin A Ester concentrate together with representative samples of well known fish liver oils and vitamin A concentrates were subjected to an accelerated keeping test in our laboratories.

These vitamin A materials were first assayed to determine initial potency, then placed in especially designed reaction cells and subjected to thorough aeration at a temperature of 45° Centigrade (113° F.) for five hours at a time. At the end of each five-hour period the vitamin A potency of each concentrate was determined by the antimony trichloride reaction.

In this severe test the Distilled Vitamin A Ester concentrate was able to maintain almost 100% of original potency while all but four of the other materials suffered over 60% vitamin destruction. At the 20-hour mark, the Distilled Vitamin A Ester concentrate still assayed 97% of its original potency. The next concentrate assayed 51% and the two best fish liver oils tested 75% and 44% respectively. At the end of 30 hours, all other concentrates had suffered over 60% vitamin A destruction; yet Distilled Vitamin A Ester concentrate retained 92% of original A strength.

As this stability-test chart demonstrates, Distilled Vitamin A Ester concentrate is from two to ten times more resistant to the action of heat and air than the other representative vitamin A materials tested—a fact which in part explains the strikingly increased demand by food processors for our Distilled Vitamin A.

And remember—Distilled Vitamin A in the natural Ester form is *bland*. It does not impart flavor or odor to the most delicate foods. It is *continuously available*, and in scientifically *uniform quality*. Potency specifications are met precisely to your order.

Get the facts about this superior Vitamin A concentrate. Write for "The Story of Vitamin A Esters," new, completely revised edition.

● **Here is evidence of the superior stability of DPI Vitamin A Esters*, the potent concentrate of vitamin A produced by high vacuum molecular distillation. Get all the facts—today.**

DP INC.

*Protected by U.S. product patent No. 2,205,925 and more than 50 process patents

DISTILLATION PRODUCTS, INC.

755 RIDGE ROAD WEST, ROCHESTER, NEW YORK

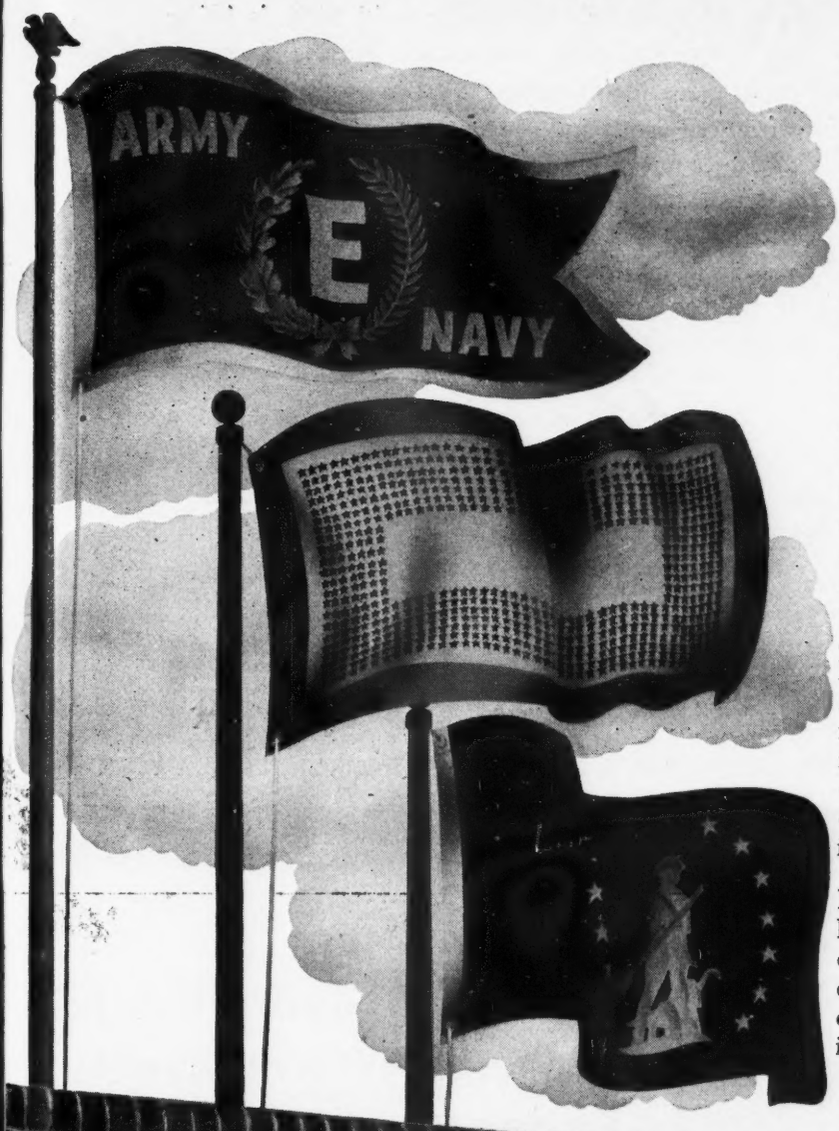
Jointly-owned by EASTMAN KODAK CO. and GENERAL MILLS, INC.

Sales Agent:

Special Commodities Division, General Mills, Inc., Minneapolis, Minn.

"Oil-Soluble-Vitamin Headquarters"

"AN OUTSTANDING CONTRIBUTION TO VICTORY"



The men and women of Merck & Co., Inc. are proud to announce that *The Army-Navy Production Award* has been conferred upon them for "great work in the production of war equipment."

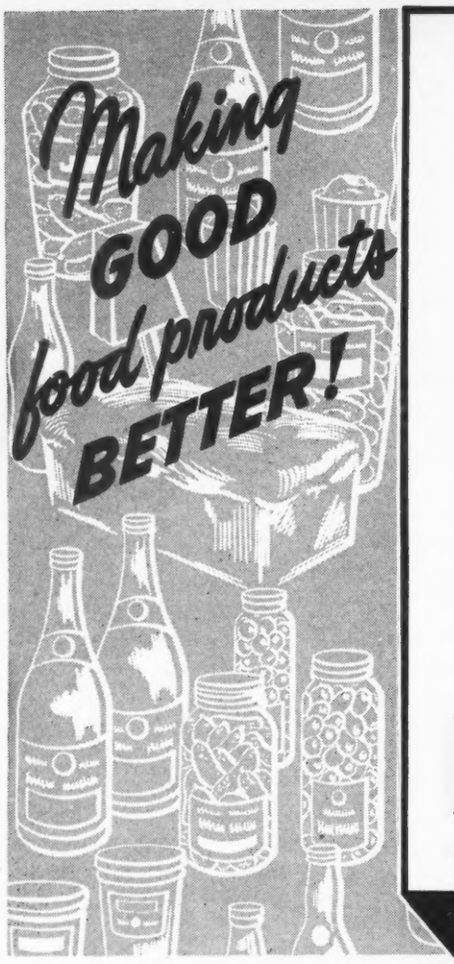
Symbolic of distinguished service to America, the Army-Navy "E" Flag now flies above our main Plant at Rahway, New Jersey, and the "E" Pin has been presented to all our workers as evidence of the fact that they are making "an outstanding contribution to Victory."

The production of essential materials for America's Armed Forces and civilian population, and for those of the United Nations, demands the utmost in care, skill, accuracy, and craftsmanship. Scientific research, rigid analytical control, and greatly expanded manufacturing facilities—combined with *esprit de corps* and thorough cooperation between labor and management—have made it possible for us not only to meet the increasing demands of our Government for millions of finished products, but to supply the basic chemicals necessary for production by hundreds of other concerns in every branch of industry.

In accepting the award conferred upon us, we have joined together in assuring the officials of our Army and Navy that we will not relax our efforts, and that they can count on us for continued all-out production until this war is won.

MERCK & CO., Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

★ ***Fine Chemicals for the Professions and Industry Since 1818*** ★



ARMSTRO Edible Lactic Acid 50% is being employed with outstanding success by many progressive manufacturers today in producing a wide variety of foods and beverages. It offers distinct advantages not only in facilitating the manufacturing process, but in actually improving the finished product.

Significant indeed is our growing list of customers in the food field . . . significant, too, the new and varied uses they are making of this quality acid.

Armstro

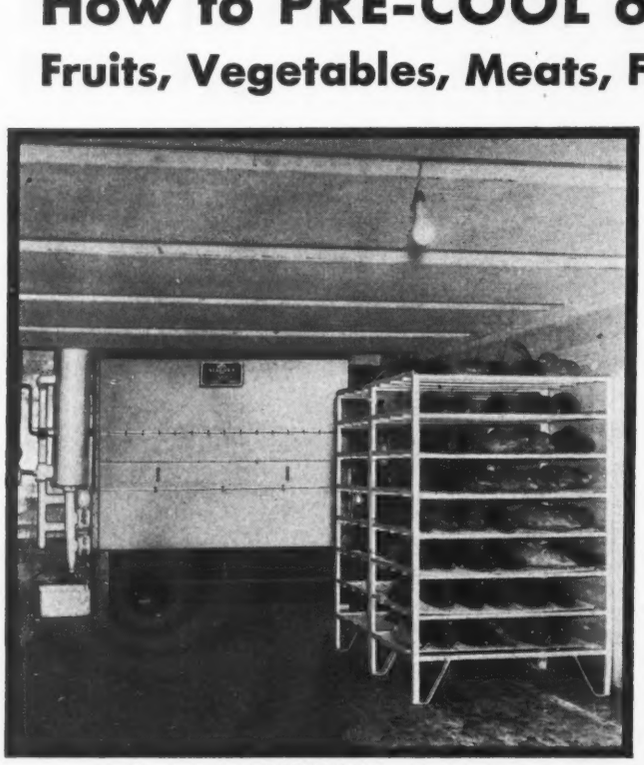
EDIBLE

LACTIC ACID 50%

C. M. ARMSTRONG, INC. • 9 EAST 46th STREET, NEW YORK

How to PRE-COOL or FREEZE

Fruits, Vegetables, Meats, Fish, before Dehydration, for Highest, Uniform Quality



PATENTED

● The NIAGARA "No Frost" System provides a reliable method for obtaining:

1. *Extreme low temperatures for freezing by the air method.*
2. *Greater economy in refrigerating space below 32° F.*
3. *More dependable refrigeration and better control of temperatures.*

The "No-Frost" Method eliminates icing of coils and increases the capacity of the compressor system, allowing an increase in refrigerated space without greater equipment cost.

Practical experience for many years. Users of NIAGARA "No-Frost" Systems are well known large concerns expertly processing large volumes of different foods.

Write for complete information and Niagara Bulletins 83 and 95. Address Dept. FI-33.

NIAGARA BLOWER COMPANY

General Sales Office: 6 E. 45th Street, New York City

37 W. Van Buren St., Chicago — Fourth & Cherry Bldg. Seattle

District Engineers in Principal Cities

NIAGARA INDUSTRIAL COOLING • HEATING • DRYING HUMIDIFYING • AIR ENGINEERING EQUIPMENT

HOW THE *Chinese* GET THEIR

Calcium

The Chinese diet is notably low in milk and milk products, yet the Chinese seem to be able to get enough calcium. According to one authority, it apparently comes from cooking cuts of meat containing bone in Chinese rice vinegar which extracts the calcium.

America drinks more milk . . . eats more dairy products . . . probably than any other country in the world. Yet nationally known nutritionists are agreed that a high percentage of our population is suffering from a lack of calcium. Equally disturbing is the deficiency in iron that causes many to be anemic.

The Chinese way of getting calcium probably wouldn't appeal to many of us. But there is an easy and economical way to compensate for this deficiency without altering the usual American diet. Simply add those essential minerals to the staple food products that already enjoy universal appeal.

With Victor Mineral Supplements you can provide vital calcium, phosphorus and iron in your product . . . be it cereal, soup, candy, or what not . . . at no additional cost to the consumer.

Although Victor Mineral Supplements in commercial quantities are temporarily not available, now is the time to prepare your product for the stiff post-war competition to come. Laboratory samples for experimental purposes can be supplied. Our technical staff will gladly lend any assistance required in solving processing or similar problems. Just write us.

VICTOR
Mineral Supplements

- *Monocalcium* PHOSPHATE
- *Dicalcium* PHOSPHATE
- *Tricalcium* PHOSPHATE
- *Monosodium* PHOSPHATE
- *Disodium* PHOSPHATE
- *Iodized Tricalcium* PHOSPHATE
- *Sodium Iron* PYROPHOSPHATE

ARMY E NAVY

VICTOR *Chemical Works*

WORLD'S LARGEST MANUFACTURERS OF FOOD PHOSPHATES
141 WEST JACKSON BOULEVARD, CHICAGO, ILLINOIS

MATERIALS
FOR THE FOOD MANUFACTURER

The *NATURAL*
B Complex
WHEAT GERM
CORN GERM

Defatted, dehydrated, perfectly stable. Richer in B complex than original embryo. Rich sources protein of high biologic value. Among richest foods known in B complex and protein and mineral values, yet perfectly stable. Ideal materials to fortify cereals, drinks, candy, etc.

VioBin WHEAT GERM **OIL**

perfectly stable; requires no refrigeration; tocopherol content 3.5 to 4 milligrams per gram.

VIOBIN CORPORATION
36 Oak St. Monticello, Ill.
VioBin (Canada) Ltd., 637 Craig St., West, Montreal, Quebec

Why does
CARROT OIL
make foods golden yellow?

Because carrot oil contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.

Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil, and because it contributes vitamin A of high stability and desirable golden yellow color.

Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

Also producers of ThiaBee, a stabilized wheat germ products rich in Vitamin B_1.

These vitamin products are of particular interest to all manufacturers of food products.

Inquiries are invited. Literature, prices and samples to firms requesting same on their letter heads.

NUTRITIONAL RESEARCH ASSOCIATES, INC.
201 Broad Street
South Whitley, Indiana

VITAMINS A AND D

Bland, stable concentrates suitable for all Pharmaceutical and Food Purposes; also Alcohol Solutions (Water Dispersible)

Sole Selling Agents for

COLLETT CORPORATION

R·W·GREEFF & CO.
10 ROCKEFELLER PLAZA
NEW YORK CITY

PURE VINEGARS
A. P. CALLAHAN & COMPANY
2407 SOUTH LA SALLE STREET
CHICAGO, ILL.

WHERE TO STORE FROZEN FOODS

EST. 1866 *High Quality* and **UNIFORMITY**
In Our Brands of...

Tapioca Flour — Rice Starch
Pearl Tapioca — Potato Starch
Egg Albumen — Rice Flour
Egg Yolk — Potato Flour
Stabilizers — Soya Bean Flour
Corn Starch — Vegetable Gums
Granulated and Flake Tapioca
Pure Food Dextrines

STEIN, HALL & COMPANY, Inc.
285 Madison Avenue, New York
Boston Providence Chicago Rochester Philadelphia Charlotte Toronto Buffalo San Francisco Los Angeles

PROFESSIONAL SERVICES

LANCASTER, ALLWINE & ROMMEL
Interesting booklet concerning Inventions, Patents, Trade-Marks and Copyrights, together with schedule of Government and Attorney's Fees, sent without obligation. Simply ask for "booklet and schedule."
Established 1915
Patents & Trade-Marks
Suite 457, 815—15th St., N. W., Washington, D. C.

THE NATIONAL COLD STORAGE CO., INC.
Facilities for All Perishable
FROZEN FOOD STOCKS
New York City Area Distribution Made Convenient by Using our
Brooklyn and Jersey City Warehouses
General Offices
60 Hudson St. New York, N. Y.
REctor 2-6590

FOSTER D. SNELL, INC.
Our chemical, bacteriological, engineering and medical staff with completely equipped laboratories are prepared to render you Every Form of Chemical Service
Ask for copy of Bulletin 3W
302 Washington St. Brooklyn, N. Y.

QUAKER CITY COLD STORAGE CO.
PHILADELPHIA, PA.
3 WAREHOUSES 3
Proper Temperature For Frozen Foods

IF YOU HAVE ANY PROBLEM OF SPOILAGE IN FOODS OR BEVERAGES WRITE US ABOUT
SEPCO
A non-toxic Fermentation Inhibitor
TASTELESS
ODORLESS
EFFECTIVE
NON-TOXIC
SETHNESS PRODUCTS COMPANY
1300 W. Division St. Chicago
—Also manufacturers of Caramel Color—

WHERE TO BUY
Featuring additional Equipment Materials and Supplies for the Food Processing Industries

CANNING MACHINERY
FOR
FRUITS · VEGETABLES · FISH · ETC.
A. K. ROBINS & CO. INC. BALTIMORE, MD.
WRITE FOR CATALOGUE

Both

FLAVOR and VOLUME

The high production volume of the FERRY CONTINUOUS POTATO-CHIP MACHINES

is attained without sacrifice of *flavor.* For, while the output of 350-lbs. of potato chips per hour is given by the large model of this completely automatic machine—still its perfect control of crispness, saltiness and taste makes these qualities uniformly GOOD.

Every operation is automatic and continuous, including the feed of unpeeled raw potatoes —the peeling, slicing, frying, drying, cooking and salting.

To make MONEY in manufacturing potato chips, install the FERRY Continuous Machine. 5 sizes are available, from 50-lbs. to 350-lbs. per hour.

Write for Bulletin FI and Price List.

J. D. FERRY CO.

129 South Cameron Street

HARRISBURG, PA.

Industrial Truck Care Pays You Dividends

A. E. DOROD

ASSISTANT CHIEF ENGINEER, BAKER INDUSTRIAL TRUCK DIVISION
THE BAKER-RAULANG CO.

BAKER HELPS VITAL WAR PLANTS TO "KEEP 'EM RUNNING"

"The investment in regular inspection and lubrication of your industrial trucks is one of the best you can make." This statement from an article appearing in recent trade publications, written by a Baker engineer, is more true today than ever before. The unprecedented increase in industrial production and the huge amount of handling required in the movement of war materials, have created demands for power trucks which are taxing the productive capacities of truck manufacturers. Thus, with new equipment difficult to get, truck maintenance is extremely important, for trucks now in service must be kept running at top efficiency . . . So that the essential points of truck maintenance may be made available to everyone concerned with their operation, reprints of this article are offered in bulletin form.

★ ★ ★

Do You Know
That many possible causes of excessive wear or loss of power are not apparent in ordinary running but can be determined only by inspection?

Do You Know
That over-lubrication can often be as harmful as under-lubrication?

Do You Know
That it is desirable to blow the dust and dirt off the truck daily before oiling?

Do You Know
That overloading a truck is helping the Axis by breaking down irreplaceable equipment?

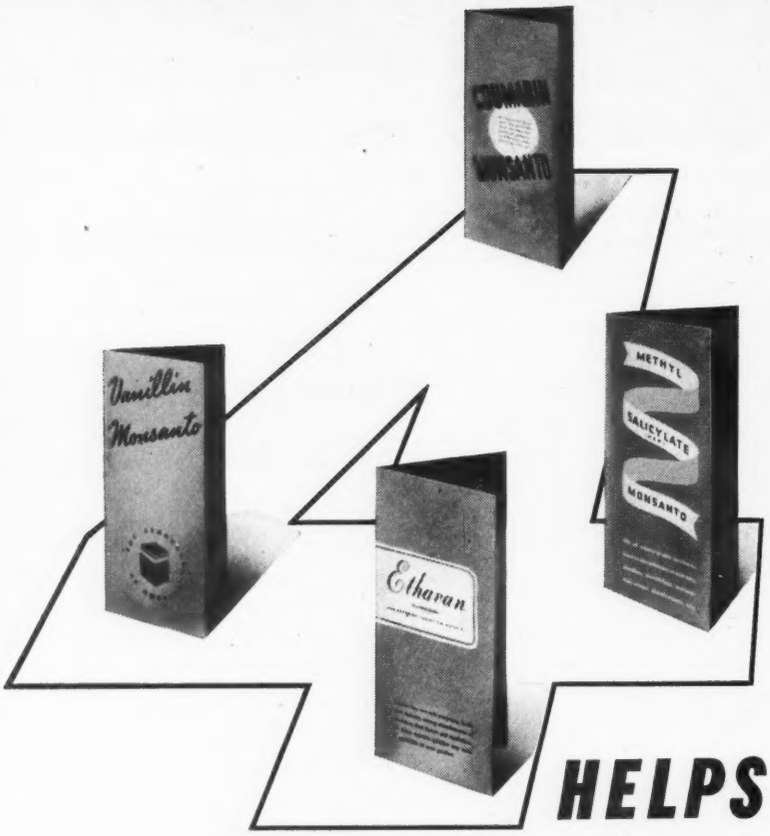
Do You Know
That service brakes shou'd be tested for stopping with the heaviest load to be carried, and parking brakes for holding maximum load on steepest incline truck must negotiate?

These are a few of many points covered in the Baker bulletin "Industrial Truck Care." Write for your copy or copies today.

BAKER INDUSTRIAL TRUCK DIVISION *of The Baker-Raulang Company*
2146 WEST 25th STREET • CLEVELAND, OHIO

In Canada: Railway and Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS



HELPS to quality control

HERE are four food ingredients in which you can be certain of uniform, high quality—even in these hectic days.

Despite wartime pressure for more and more production, *every* batch of each of these four Monsanto flavors is rigidly controlled at *every* step in their manufacture. *Every* batch is then double checked by skilled and highly trained analytical chemists in our control laboratories before it leaves for your plant. Add to those safeguards, the fact that each of these four Monsanto flavors is made largely from raw materials produced within Monsanto's own plants under equally strict controls . . . and you can see why Monsanto flavors are known throughout the food industry for *uniform* high quality. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, St. Louis, Missouri. District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco, Montreal, Toronto.

ARMY E NAVY

"E" FOR EXCELLENCE . . . the Army-Navy "E" burgee with two stars, "representing recognition by the Army and the Navy of especially meritorious production of war materials" over a two year period, flies over Monsanto.

MONSANTO CHEMICALS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

MAILING LISTS THAT WORK . . .

McGraw-Hill Industrial Mailing Lists are a direct route to today's purchase-controlling executives and technicians in practically every major industry.

These names are of particular value now when most manufacturers are experiencing constantly increasing difficulty in maintaining their own lists.

Probably no other organization is as well equipped as McGraw-Hill to solve the complicated problem of list maintenance during this period of unparalleled changes in industrial personnel. These lists are compiled from exclusive sources, based on hundreds of thousands of mail questionnaires and the reports of a nation-wide field staff, and are maintained on a twenty-four hour basis.

Investigate their tremendous possibilities in relation to your own product or service. Your specifications are our guide in recommending the particular McGraw-Hill lists that best cover your market. When planning your industrial advertising and sales promotional activities, ask for more facts or, better still, write today. No obligation, of course.

McGraw-Hill Publishing Co., Inc.

DIRECT MAIL DIVISION

330 WEST 42nd STREET NEW YORK, N. Y.

Tomorrow's Soup WILL COME IN PACKAGES

Buell Powder Collectors Prevent Waste ...Pay for Themselves in Savings

Pea soup, beef broth and many another steaming bowl of goodness now come to the kitchen as neatly packaged powders. Although these powdered soup mixtures are already volume production, the government has asked dehydrators to up 1943 output to 200 million pounds.

In spray dehydrating soups, milk, eggs, citrus juices and other foods, powder losses in the exhaust frequently run unreasonably high. This waste can be virtually eliminated by installing Buell Powder Collectors in conjunction with your spray dryers.

Buell Powder Collectors specially designed for food processing are made of special metals to meet all Pure Food requirements. Corners are rounded to prevent lodgement of material, and an ingenious hinged construction facilitates take-down for easy cleaning.

The high efficiency of Buell collectors is due to the patented van Tongeren cyclone—an exclusive Buell feature. Buell Powder Collectors have no moving parts, require little or no attention, will not clog, and cost little to operate.

Write for factual 28-page book "Bulletin G-842"

BUELL ENGINEERING COMPANY, INC.
8 Cedar Street, Suite 5000, New York
Sales Representatives in Principal Cities

BUY WAR BONDS AND MAKE THE AXIS BITE THE DUST

CONSULT BUELL *First* IN DUST RECOVERY
for Chemical • Rock Product • Metallic • Food • Flue or any other dusts

buell
POWDER RECOVERY SYSTEMS

INSIDE NEWS

MARCH PREPARED BY NATIONAL CAN CORPORATION, NEW YORK, N. Y. 1943

Vegetable-Juice Blends May Become Important Post-War Food Items

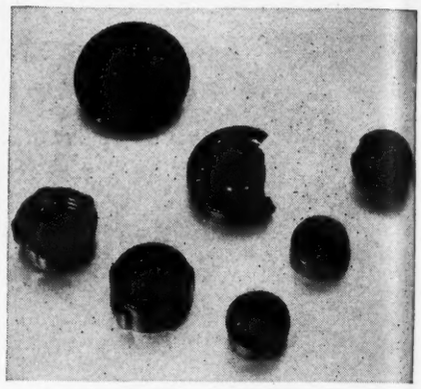
Problem Is To Increase Acidity In Order To Preserve High Vegetable Flavors

More varied packs of vegetable juices may find their way to retail shelves when wartime restrictions on containers are lifted, and blended juices probably will be used to a much greater extent. Experiments recently conducted in New York State show that the blended juices have advantages over unblended juices.

One of the chief difficulties in developing high-quality vegetable juices is that most vegetables are so lacking in acidity that they must be subjected to long periods of processing at high temperatures in order to destroy all bacterial life and thus lose their flavor and other desirable characteristics. If the acidity of the juice can be increased so as to prohibit the growth of certain heat-resistant bacteria, the product can be preserved by flash pasteurization that has proved so successful in preserving the high quality and flavor of fruit juices.

Rather than attempting to increase the acidity of vegetable juices by adding mineral acids, such as hydrochloric or phosphoric acids, or organic acids, such as lactic and citric acids, blending of the vegetable juice with juices of higher acidity, such as rhubarb or sauerkraut juices, is recommended. Of the two, sauerkraut juice has proved the more desirable because it does not mask the flavor of the juice with which it is blended.

Sauerkraut juice has been blended successfully with the juices of carrots, celery, rutabagas, beets, white turnips, onions, and red cabbage. Thus far, the carrot-sauerkraut blend is regarded as having the best flavor and appearance, although some of the sauerkraut-celery blends have also proved very palatable and attractive. In every instance the sauerkraut blends were deemed superior to the pure unacidified vegetable juice. (288)



Wartime closures made of bagasse, a semi-thermosetting type of plastic material

Bagasse Source of Plastic Material

A new molding compound made of bagasse, containing no critical chemicals, has been developed. It is a semi-thermosetting type of material, with a distinct leaning toward an impact technique of molding.

Restriction of essential chemicals used in the manufacture of the first line molding compounds prompted research on a substitute product made without any priority material. After considerable experimentation, a filler was developed from bagasse which, when used in combination with the bagasse resin, was found superior to wood-flour and other familiar types of filler. Finally, all chemicals were eliminated and a molding compound made of the bagasse alone. (292)

Woodpulp Developed as Base for Smokeless Powder

Adaptation of woodpulp for the manufacture of smokeless powder has increased powder production by 25 per cent in American, Canadian and Australian munitions plants. The new process has freed Canada and Australia from dependence on cotton as a base for explosives, it is claimed.

The woodpulp development has been made available to the United Nations governments and all American producers. Developers of the process estimate that it will lower the cost of manufacture of smokeless powder in the United States by $20,000,000 in 1943. (289)

Substitute for Cork

Tests have been carried out in Jamaica with a view to using a locally grown plant as a substitute material for cork, according to recent trade reports. This new product has been developed from the roots of a swamp plant known in Jamaica as "cow apple". The botanical name of this plant, which is found in large quantities in the swampy areas around the island, is Annona palustris. Corks from this root have been made experimentally by one Jamaican firm. It is stated that they are not satisfactory for corking bottles of rum, but could probably be used for vinegar and similar liquid products. (290)

* * * * *

Phosphorescent paint applied to the walls of a darkened blackout room can provide enough glow to guide a person's movements. (291)

New Cleaning Agents

A new group of polyphosphates is compared with the commonly used alkaline detergents. The polyphosphates are excellent water softeners. They differ in their effects on different types of water and the right one must be selected for a particular hard water.

There is the possibility of utilizing the physical action of the organic detergents in cleaning instead of the chemical action of the alkalies. Combinations of alkaline and organic detergents may be fitted to particular jobs. It is said to be possible to soften protein films by the action of enzyme papaine, especially when the latter is supplemented with a wetting agent.

An acid can-washing solution is described which is more effective and more economical than the usual alkali solution. Similarly, suitable wetting agents may be combined with the polyphosphates in bottle-washing to give more brilliant bottles. (293)

NATIONAL CAN

PLANTS: NEW YORK • BOSTON • BALTIMORE • CHICAGO • HAMILTON, OHIO • FORT WAYNE, INDIANA

New 5-Minute Test for Rubber

To facilitate the determination of the rubber content of 1,500 to 2,000 different species and varieties of plants in connection with a rubber research program, there has been developed a five-minute, microchemical test for the presence of rubber.

The test consists principally of the use of a dye dissolved in a mixture of solvents. The solvents penetrate the plant tissue and kill and preserve it for microscopical examination, and the dye stains the rubber and resins that are present. Additional treatments remove the stained resins and leave the rubber. Roots, stem and leaves of the plants are sectioned with a razor blade, tested, and the amount of rubber in the most promising plant samples is then determined accurately by quantitative chemical analysis. (294)

Peacetime Equipment for Wartime Service

National Can facilities are available for speedy, efficient service on all types of permissible metal containers. (295)

Resins Improve Method of Softening Water

New resins are replacing old zeolite minerals and greensands for special uses requiring softened water of excellent quality, such as in breweries, canneries and beverage plants. Extended application of the resins to prevent spoilage of medicinal enzyme preparations, to purify drugs and to recover vitally needed metals from industrial wastes have been predicted for the future. (296)

* * * * *

No less than two hundred and eight distinct varieties of wheat are grown on farms in the United States. Of these varieties, 11 occupy more than 1,000,000 acres each. (297)

Technical Topics

YUCCA HARVEST—Two West Coast companies are beginning to harvest Yucca from desert lands of Arizona as an emergency source of fibre. (298)

DRY FLAVORS — Flavoring extracts of most of the popular flavors have now been reduced to powder and tablet form. Army-inspired research to solve shipping breakage of the traditional liquid extract is responsible for the new development. (299)

GRAPE SUGAR FUEL—The motor bus service between Santiago and Valparaiso, Chile, is now running on a fuel mixture made largely from grape sugar residues, formerly almost entirely wasted. (300)

VITAMINIZED SOAP — A process for impregnating toilet soap with vitamin D in such a manner that the vitamin can be absorbed by the skin is said to have been developed by an Ohio firm. (301)

COFFEE CONSERVATION — Development of a process for sealing the flavor in coffee beans before roasting, so that coffee consumption may be reduced twenty-five per cent, has been recently reported. (302)

FOOD EQUIPMENT—Methods for comparing the efficiency of different methods of cleaning and sterilizing food processing equipment have been developed by the New York State Agricultural Experiment Station at Geneva, N. Y. (303)

CITRIC ACID SUBSTITUTE—The citric acid shortage has brought forth a new product which is described as suitable for use in nearly all items for which the acid has been a constituent part. One gallon of the product is said to be equivalent to 14 pounds of powdered citric acid. (304)

COD LIVER OIL OINTMENTS are just as effective as sulfa compounds in the treatment of wounds and burns, according to certain medical men. In some cases, results have been far superior to those obtained with the use of tannic acid. (305)

WHEAT GERM OIL—The addition of wheat germ oil to dried whole milk will prevent the rapid spoilage tendency under wartime shipping conditions, according to research workers. (306)

SYNTHETIC PUMICE — Soap bubbles, after being strengthened with liquid glue, are now mixed with cement. After hardening, this process produces a block similar to pumice stone which floats on water and has the heat-insulating qualities of cork. (307)

NEW TEXTILE FIBRE—The finest filament produced by man or nature is a new synthetic textile fibre with a diameter of one ten-thousandth of an inch. Twenty thousand miles of this fibre weighs only one pound. (308)

CORK SUBSTITUTE — Washington and Oregon can produce 100 tons of bark of the Douglas fir tree, now being used experimentally, to relieve the cork shortage. The bark is ground, treated with water and ammonium hydroxide to give elasticity and then pressed into shape. (309)

PYRETHRUM TOXICITY TESTS—Pyrethrum extract testing to determine the relative toxicity of pyrethrins I and II was discussed in a recent British technical journal. Modifications of the current test methods were described involving the use of a potassium hydroxide solution to saponify the esters. (310)

PENCILLIUM—Puberulic acid has been found to be another metabolic product of the *Pencillium* species of molds which possesses high antibacterial properties. Pencillin had heretofore been shown to be a potent bactericide, even when highly diluted. Puberulic acid has been found to suppress the growth of a large number of Gram-positive bacteria at very high dilutions. (311)

VITAMIN A TEST—Vitamin A potency of oils, liquid foods, and drugs can now be determined mechanically by a new instrument which measures light absorption through a test sample at a wave length of approximately 328 millicrons. Operation of the instrument is based on the current output of a photocell, activated by a beam of light filtered to the characteristic absorption band of Vitamin A. A mercury vapor lamp acts as the light source. (312)

BOTANICAL DRUG CULTIVATION has been actively promoted in Australia during the past year, with the result that plants for the manufacture of hyoscine, hyoscyamine, and opium alkeloids were operated. Other products, the domestic production of which will be possible in coming seasons, are the digitalis glycosides, strychine, ephedrine, emetine, santonin and felix-mas, strophanthin and quabaine, and ergot. (313)

Every effort will be made to furnish additional information on these articles. Where such information is not obtainable, we will refer inquiries to the original source of the article. Write to National Can Corp., 110 E. 42nd Street, New York City. Please mention the number at end of article—also name of the magazine you saw it in.

(Advertisement)

NOVOID CORK INSULATION
saves 3 important ways

SAVES REFRIGERATING EQUIPMENT: Because cork is the most efficient low temperature insulation, you can hold desired temperatures with smaller freezing units. And since securing equipment is such a big problem today, this saving is mighty important.

SAVES OPERATING EXPENSE: With Novoid Corkboard and Cork covering on the job units operate less and refrigeration costs are cut to a minimum.

SAVES MATERIAL AND LABOR: Structurally strong Novoid Corkboard is quickly erected without metal lath or lumber. And because it is highly resistant to moisture and deterioration, it keeps its efficiency and gives complete freedom from maintenance expense for years.

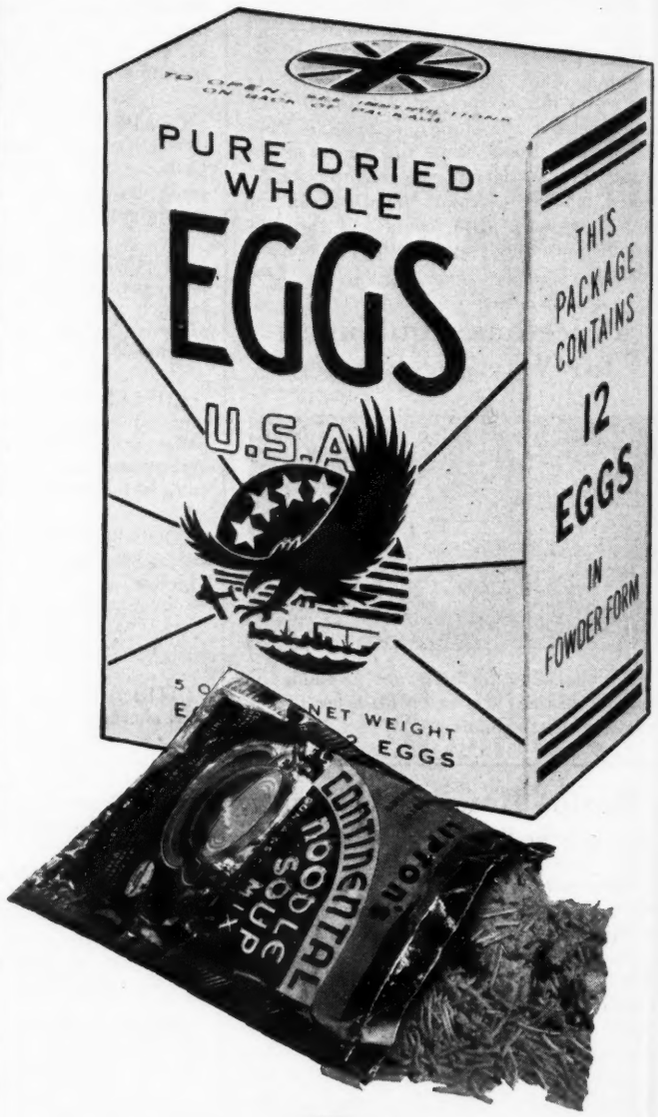
Novoid Mineral Wool Board Also Available
This insulating material for general low temperature usage, is basically mineral wool mixed with waterproof binder. It equals or exceeds Federal Specification HH-M-371 for block or board insulation. Get the full facts now about Novoid Insulation. Write today to Cork Import Corporation, 330 West 42nd Street, New York City.

NOVOID INSULATION

CORKBOARD • CORK COVERING • MINERAL WOOL BOARD

Need help in packaging a dehydrated food?

Ask S & S! Many of the finest packages developed for all types of dehydrated foods have grown out of the close collaboration of Stokes & Smith with some of the Country's largest packers. And, if you're entering this field, you'll find that we have done much of your basic work for you . . . can show you many a short-cut to your goal of speedy, *economical packaging, in packages that really protect!* Consult us freely!



STOKES & SMITH Co.
PACKAGING MACHINERY — PAPER BOX MACHINERY
PHILADELPHIA, U. S. A.

If you plan to

DEHYDRATE OR QUICK FREEZE

—Call KERBY SAUNDERS, First!

Dehydration—especially for vegetables—is, in the final analysis, a special form of Air Conditioning—Quick Freezing, a special form of Refrigeration.

Long before the present Government Dehydration and Quick Freezing Programs, our personnel was spending all of their time in Air Conditioning, Refrigeration, Dehydration and Cold Storage Work.

At the present time, we are handling Air Conditioning installations involving many million C.F.M. of Air, and thousands of tons of refrigeration. Our present contracts involve millions of dollars.

We know from experience which fans, controls, heaters, etc. to use to secure a definite result—Not only in the winter when air is naturally dry—but next September when humidities will be high and production curtailed we propose to compensate for these conditions.

DON'T pay more for experiments than we would charge for a correctly engineered and constructed plant. With present delayed deliveries, it will be very expensive to correct mistakes in the producing season.

WRITE OR WIRE—

KERBY SAUNDERS, Inc.

330 WEST 42nd STREET *Engineers and Contractors* **NEW YORK CITY**

DEHYDRATION • REFRIGERATION • AIR CONDITIONING

Make flavor go further with D•O

SPICEOLATES

"SOLUBILIZED" SPICE OIL FLAVORS

Solve one of today's big supply problems resulting from governmental restrictions on the use of spice oils with . . . SPICEOLATES.

These fine spice flavors can be used with considerable advantage—not only in replacing completely the dry spices you may now be using—but also to extend your present spice supplies.

WRITE US WITHOUT DELAY!

DODGE & OLCOTT COMPANY

180 VARICK STREET · NEW YORK, N. Y.

BOSTON · CHICAGO · PHILADELPHIA · ST. LOUIS · LOS ANGELES

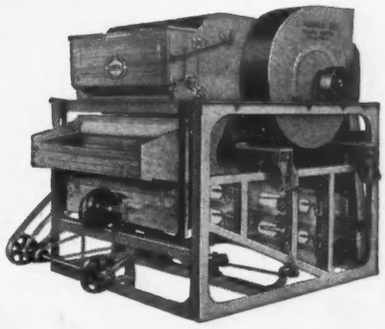
Plant and Laboratories Bayonne, N.J.

EUREKA

'magic—screen'

CLEANERS GRADERS

Large Capacity



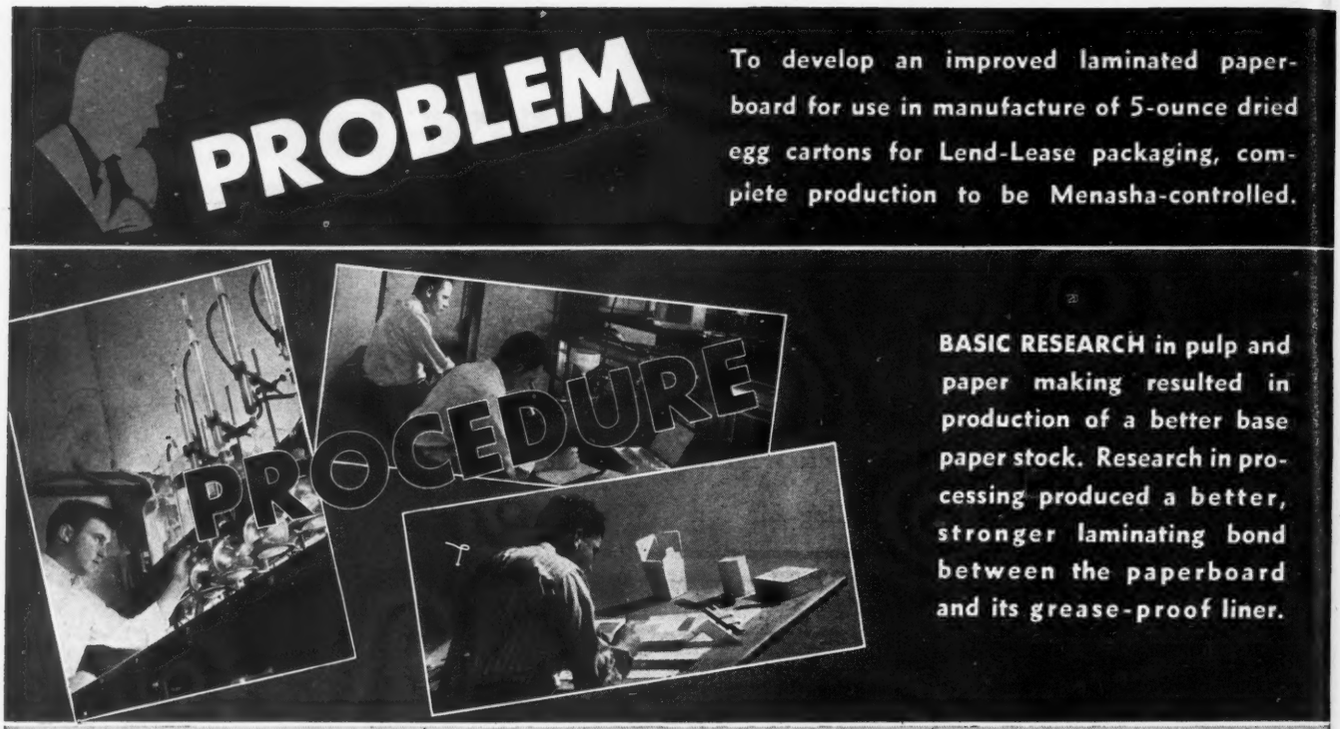
Small Expense

Accurate Separations

Rapid screen-and-air cleaning and grading—at large capacity—at small expense. A thousand correct answers for Peas, Beans, Grain, Rice, Seed, Coffee, Nuts, Berries, Vegetables, Herbs, etc. . . . Several types and many sizes—dependable for every service—'super-built—'super efficient.

Ask for Catalog I-175

S. HOWES CO., INC., Silver Creek, N. Y.


PROBLEM
To develop an improved laminated paperboard for use in manufacture of 5-ounce dried egg cartons for Lend-Lease packaging, complete production to be Menasha-controlled.
PROCEDURE
BASIC RESEARCH in pulp and paper making resulted in production of a better base paper stock. Research in processing produced a better, stronger laminating bond between the paperboard and its grease-proof liner.
SOLUTION
MENASHA'S IMPROVED DRIED EGG CARTON WHICH HAS THESE PROPERTIES: 1. High grease-proofness. 2. Required moisture-vapor proofness. 3. A stronger lamination which holds firm in the high temperatures of wax dipping. 4. A less absorbent paperboard which reduces the "soaking up" of wax when dipped.
PURE DRIED WHOLE EGGS U.S.A.
THIS PACKAGE CONTAINS 12 EGGS IN POWDER FORM
5 OUNCES NET WEIGHT EQUAL TO 12 EGGS
That coordinated effort of paper-making technicians and paper treatment technicians is a regular Menasha procedure. It has untied knots, broken bottlenecks in countless war packaging problems. This practical method is applied to a wide range of packaging work: bags, cartons, over-wraps and combinations of these packages . . . packages for food, cereals, powders . . . packages for dehydrated and frozen foods . . . packages for metal parts and munitions. Menasha welcomes a chance to show its versatility in package development, to present you with a package solution which is right!
Send for booklet "Menasha Wartime Packaging"
THE MENASHA PRODUCTS CO.
Division of Marathon Paper Mills Co.
MENASHA
WIS.
Menasha PRODUCTS
BAGS
CARTONS
OVER-
WRAPS
Heat-Sealing Bag for Moist or Liquid Content Frozen Foods
Over-wrapped Cigarette Carton for Overseas Shipment
Food Concentrate Carton for Ration K Package
Heat-Sealing Ration K Bag
Ration K Package with Heat-Sealed Over-Wrap
Cartridge Clip
Cartridge Carton
Heat Sealing Bag for Food Concentrates, Drugs, etc.

CLEAVER-BROOKS EQUIPMENT . . .

HELPING TO KEEP FIGHTING MEN *in Action*

BUY WAR BONDS

. . . ON THE FAR-FLUNG FRONTS OF GLOBAL WAR

In action with our fighting forces all over the world are "silent secret weapons" like these Cleaver-Brooks units . . . contributing to the health and welfare of our troops on far-flung fighting fronts.

Cleaver-Brooks' portable shower bath units —disinfecting, sterilizing, and water distilling equipment help our fighters to keep fit for action! Cleaver-Brooks portable bituminous boosters and tank car heaters permit miracles in speedy construction of airports, military roads, supply roads, and many other facilities vital to supremacy in modern warfare.

On the home front, Cleaver-Brooks steam generators are providing low-cost steam for power and processing needs in hundreds of industrial and ordnance plants. All of this equipment is fired with the universal and ideal fuel—OIL! The multi-pass, down-draft heating principle with fuel-oil — first made famous in Cleaver-Brooks tank-car heaters, bituminous boosters, and steam generators—finds a vitally important application in these "silent secret weapons" of our military services.

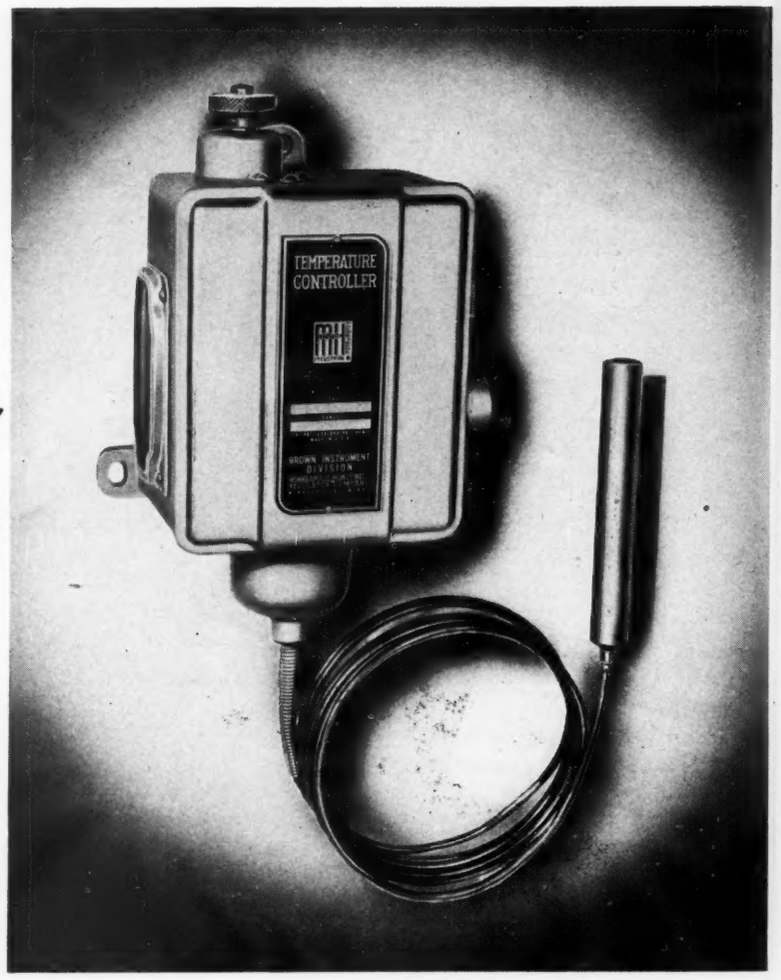
Now manufactured for a nation at war, Cleaver-Brooks' equipment will resume its peace-time applications when Victory Day is here.

CLEAVER-BROOKS COMPANY · 5103 N. 33rd STREET · MILWAUKEE, WISCONSIN

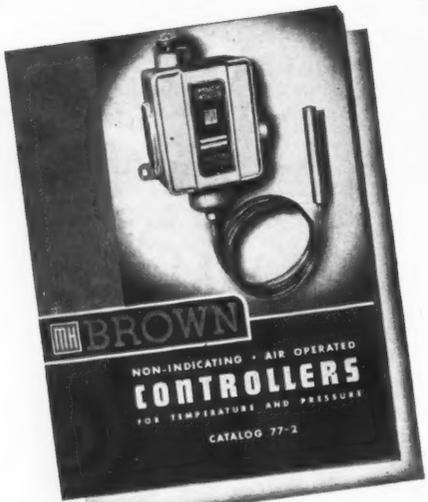
CLEAVER-BROOKS COMPANY • MILWAUKEE, WISCONSIN

Control Instruments for FOOD

A Simple Non-Indicating Temperature or Pressure Controller for Batch Processes



SENT ON REQUEST:



For complete details about Brown Non-Indicating Air-Operated Temperature and Pressure Controllers, write for catalog 77-2. Outstanding features and specifications are fully explained.

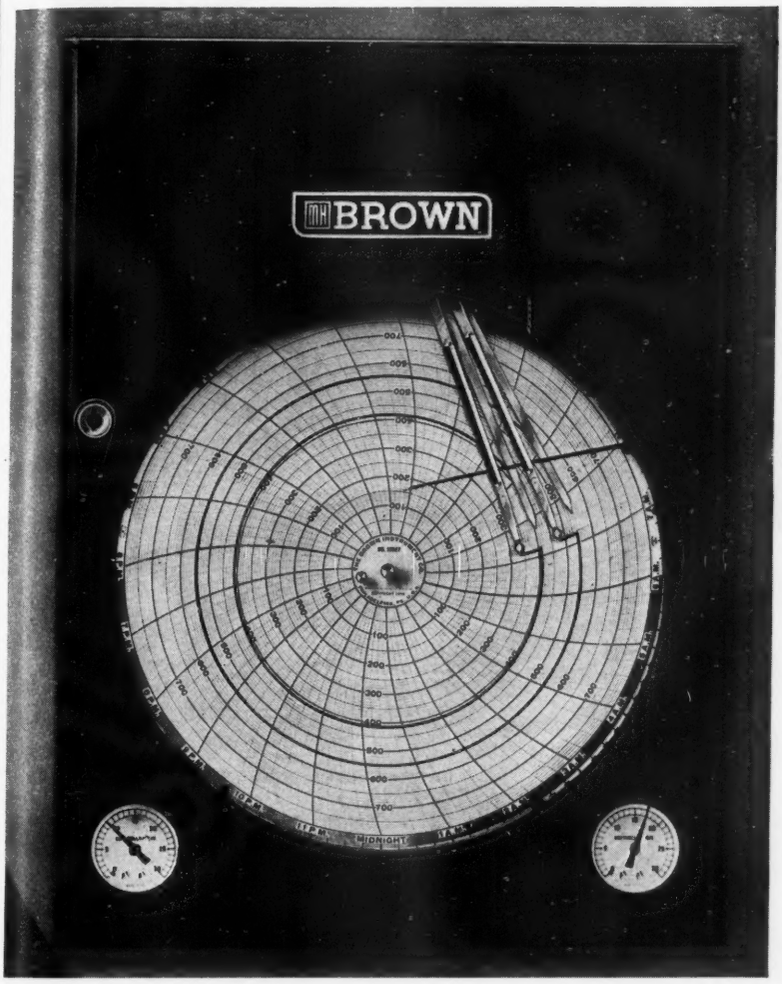
IF you are now engaged in or contemplating the processing of dehydrated foods—Precision Measurement and Control of Temperature and Humidity *is an important requisite.*

Regardless of the type of dryer, whether it be Continuous or Batch, Brown and Minneapolis-Honeywell Air-Operated or Electric Control Instruments can help you to speed up production—maintain uniform quality and appearance in the finished product—safeguard against costly over-drying—under-drying—and waste.

★ ★ ★ **Brown**

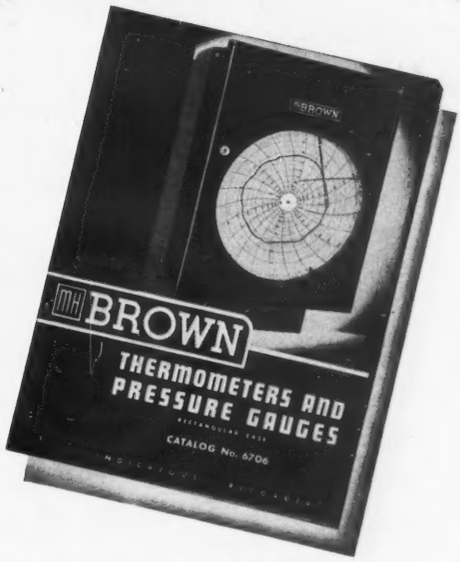
and MINNEAPOLIS

Available DEHYDRATION



Recording Temperature and Humidity Controller for Continuous Processes

SENT ON REQUEST:



Get the facts about Brown Indicating, Recording and Control Thermometers. Brown Thermometers are applicable for temperatures ranging from —40° F. to + 1,200° F. The bulb location can be any distance up to 200 feet. Available as vapor, gas, or mercury-filled Thermal systems. Write for catalogs 8903 and 6706.

Without obligation, a Brown control Engineer will be glad to call at your plant and recommend the correct instrumentation for your specific process. In purchasing Dehydration Equipment ask for Brown and Minneapolis-Honeywell Controls. Write for catalogs. THE BROWN INSTRUMENT COMPANY, 4502 Wayne Avenue, Philadelphia, Pennsylvania, a division of Minneapolis-Honeywell Regulator Company, Minneapolis, Minnesota. Offices in all principal cities. 119 Peter Street, Toronto, Canada—Wadsworth Road, Perivale, Middlesex, England—Nybrokajen 7, Stockholm, Sweden.

THERMOMETER CONTROLLERS

HONEYWELL CONTROLS

Want Cast Fittings *now?*

Government and high priority business obviously comes first. BUT... and this should interest many... Kuhns facilities and raw stocks on hand permit heavy production for other industries also.

Complete cast fittings, ¼ to 24". Fast service on stock items, ¼ to 4", for steam, drainage, sprinkler, etc. All fittings rust-resisting, of uniform smoothness and accuracy. Thoroughly inspected.

THE KUHNS BROS. CO., Dayton, Ohio

Combined marketing facilities on both "K" cast iron and M.I.F. malleables. Complete stocks of both at Dayton, Ohio, and Branford, Conn.

WRITE FOR KUHNS CATALOG TODAY

Combined marketing facilities on both "K" cast-iron fittings and M.I.F. malleables. Complete stocks at both Dayton, Ohio, and Branford, Conn.

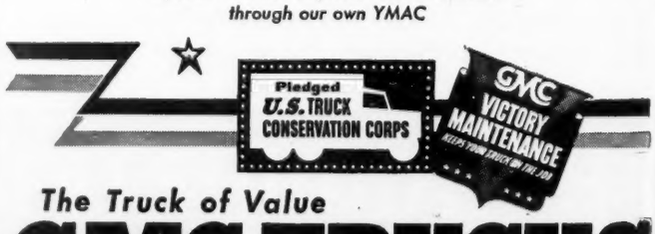
Our Duty *for the Duration*

"SERVICE MEN, in maintaining and conserving both vehicles and tires, are performing a most important function in the Nation's war effort."
Joseph S. Eastman
DIRECTOR, OFFICE OF DEFENSE TRANSPORTATION

INVEST IN VICTORY... BUY WAR BONDS AND STAMPS

Our President, as well as numerous Washington Officials and Executives has publicly recognized the vital need for keeping motor trucks on the job. To this end, Service Men have been recently classified as essential war workers. Everyone in the General Motors Truck organization... Dealers, Service Managers, Parts Men, Mechanics . . . is responding to this responsibility with all the resources at his command. These men have at their disposal years of experience with Preventive Maintenance service, special truck knowledge and training and specialized truck equipment. You can do your part by giving your trucks the best service. Thus, they'll serve America better!

Special "Service Payment Plan" available through our own YMAC



The Truck of Value

GMC TRUCKS

GASOLINE - DIESEL

We want to thank you, the many thousands of you who in the past few years have made Johnson's Wax-Fortified Paints and Enamels one of America's fastest selling brands. But now we must discontinue the manufacture of this most efficient paint. Certain of its ingredients are urgently needed for more important work in the war program.

To take over this job of protecting your surfaces in the most efficient manner possible today at the lowest cost, S. C. Johnson & Son, Inc., have developed Johnson's War-Formula Paints — retaining as many as possible of the outstanding advantages of Johnson's Wax-Fortified Paints.

AND NOW WE WANT TO TELL YOU ABOUT THESE

War-Formula PAINTS

. . . Specially Developed for

- *Millers*
- *Confectioners*
- *Canners*
- *Processors*
- *Bakeries*
- *Offices*
- *Machinery*
- *Dairies*

These War-Formula Paints and Enamels are made by skillful blending of fine paint resins. They have the endurance and maintenance economy so needed today.

Johnson's War-Formula Paints require no special preparation or care in application. Brush or spray them on old or new surfaces of wood, brick, metal, plaster or any painted or unpainted surface.

Send for full particulars today. These paints and enamels are specially made to meet present maintenance problems.

S. C. JOHNSON & SON, Inc.

Industrial Maintenance Division, Dept. FI-33
Racine, Wisconsin

"Send for your copy of this catalog today!"

S. C. JOHNSON & SON, Inc., Dept. **FI-33**
Industrial Maintenance Division, Racine, Wis.

Please send me a copy of your illustrated booklet, "Johnson War-Formula Paints," giving complete information and specifications for the use of Johnson's new War-Formula Paints and Enamels.

*Name*_____

*Position*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

Buy United States War Savings Bonds and Stamps

U·S·S CYCLONE

DEHYDRATION BELTS

Ideal for dehydrating VEGETABLES

Permit free movement of air through the fine steel mesh

STEADY movement and rapid processing of food products during dehydration are assured when you use U·S·S Cyclone Dehydration Belts. These rugged belts are available in meshes as small as 3/32"—fine enough to transport small diced foods.

Cyclone Belts are durable, strong, and flexible. They can carry heavy loads without breaking or stretching. They are unharmed by water, steam, or temperature changes.

AVAILABLE IN TINNED STEEL, STAINLESS STEEL, GALVANIZED STEEL

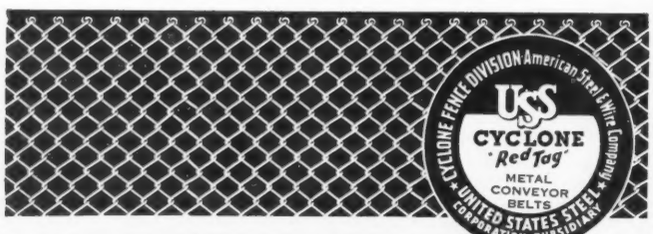
U·S·S Cyclone *Tinned Steel* Belts and Cyclone *Stainless Steel* Chain Link Conveyor Belts are highly recommended for food dehydration because they resist the corrosive effects of the highly humid, hot air.

For other jobs of goods handling, use the familiar Chain Link and Flat Wire Belts in the larger sizes which have, for so many years, been widely used by the food and packing industry.

PHONE, WRITE OR WIRE FOR FURTHER INFORMATION

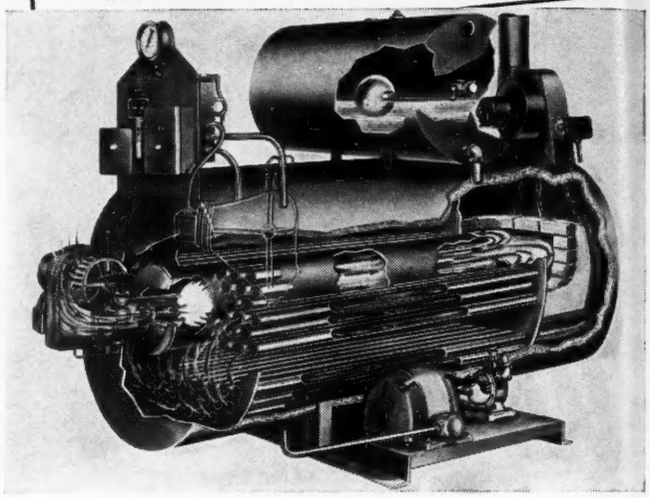
If you have any problems involving the movement of goods in your plant, call on us. Our engineers are experienced in applying conveyor belts to many processes. If you need conveyor belts for essential production, call us. We can supply you promptly with a wide variety of new metal belts developed especially for the production of dehydrated foods.

CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
Waukegan, Illinois · *Branches in Principal Cities*
United States Steel Export Company, New York



CYCLONE METAL DEHYDRATION BELTS — UNITED STATES STEEL

100 lbs. pressure from 60° water in 20 minutes



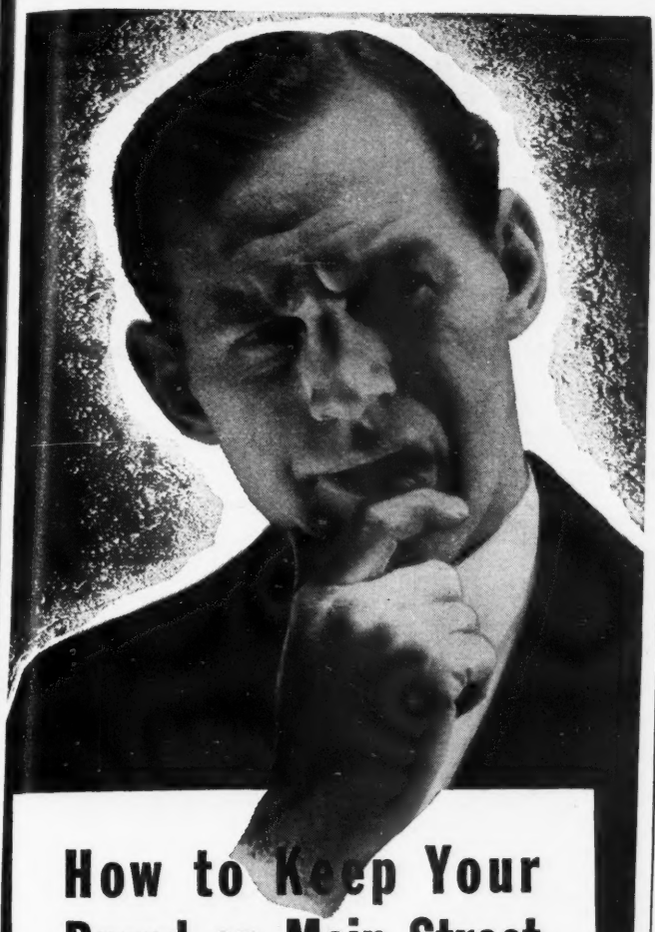
Yes THE NEW 15 H. P. O&S BOILER IS DESIGNED FOR SPEED!

ORR & SEMBOWER'S Engineers had *speed* in mind when they designed this compact 15 H. P. Boiler for use in the U. S. Army's new mobile laundry units. But as you can see in the cut-away view, the new boiler also offers several other outstanding advantages . . .

★ *Simplicity of design!*
★ *Easy cleaning!*
★ *No stack necessary!*
★ *Complete weight—2100 lbs!*

Although developed expressly for mobile use in the Army's laundry units, this unique O & S Boiler promises wide application in your industry when Victory makes O & S Boilers again available for all purposes.

O&S **ORR & SEMBOWER** INCORPORATED
Builders of Better Boilers Since 1885
READING • PENNSYLVANIA



How to Keep Your Brand on Main Street when it's "*out of Stock*"

More people will visit more Main Streets more often under rationing than ever before! Don't let your advertising "take a rest" for the duration. When you get out of the procession—you go back to the end of the line.

Alert advertisers are "staking their claims" in valuable store fronts and interiors on Main Street . . . for both today's and tomorrow's sales . . . with durable Meyercord Decal window signs and valances—back-bar, mirror, show-case and counter signs.

Main Street's memory is fickle! Your brand or trade name identification can be colorfully reproduced in decalcomania without use of critical materials. Decals are night-and-day, all-weather, out-of-the-backroom "point of sale" advertising that packs more publicity value per square inch for a longer period of time at lower cost. No space to buy—no operating expense—no up-keep.

Let us tell you how others are using Decal advertising to keep their brand names on Main Street for the duration! Free design service. Address Dept. 123

50th Anniversary 1943

DECALS SAVE METAL

FAST • COLORFUL • DURABLE IDENTIFICATION

MEYERCORD DECALS

THE MEYERCORD CO., 5323 W. Lake St., Chicago, Ill.

DAMROW

TANKS - VATS CONTAINERS

. . . are designed to fit your needs EXACTLY . . .

The *"Right* Tanks for the job" is often one of the most vital production problems in food processsing, handling, storage.

Damrow's knowledge, skill, experience and facilities to design and build tanks of unusual shapes, in any size, any metal has long been an important aid to the Food Industry. Each Damrow Tank is "Custom-Built" only after a thorough analysis and understanding of its use—based on over 30 years experience in helping Industry to more efficient and economical Containers of all types.

USE this wealth of experience and knowledge to your own profit. Let us show you how DAMROW TANK ENGINEERING can help you to modernized Tank equipment for all purposes. Just send blueprints for estimates, or write for suggestions.

DAMROW "Custom-Designed" Products include—

- OVAL—ROUND—RECTANGULAR TANKS
- STAINLESS STEEL TANKS
- ALUMINUM, GALVANIZED STEEL, COPPER, TINNED TANKS
- WOOD AND METAL LINED TANKS
- AGITATOR STORAGE TANKS
- MIXING TANKS
- TRUCK TANKS
- VAPOR-FILM HEATING TANKS
- STAINLESS STEEL FILTER TANKS
- KETTELS, CONTAINERS OF ALL SIZES AND SHAPES
- JACKETED TANKS FOR INDIRECT HEATING AND COOLING

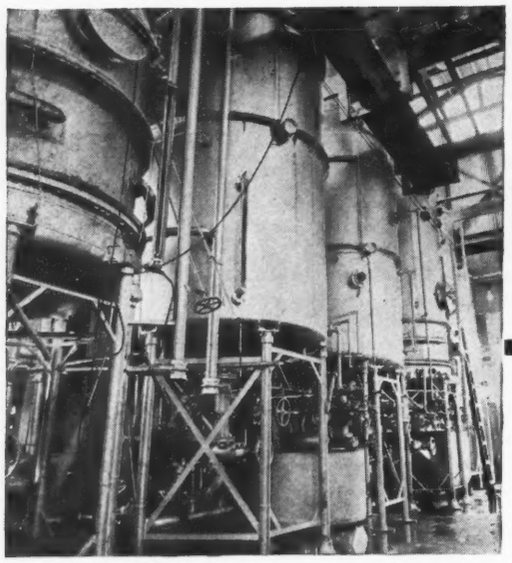
• CUSTOM-DESIGNERS of TANKS, CONTAINERS for ALL INDUSTRY

DAMROW BROTHERS COMPANY

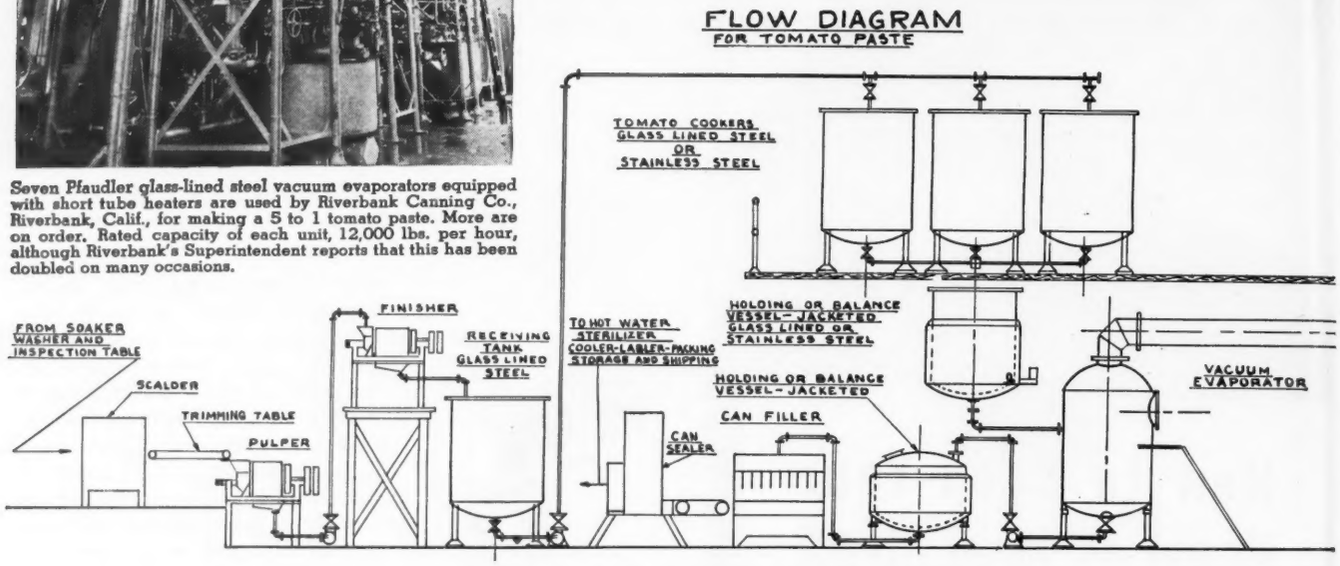
190 WESTERN AVENUE

FOND DU LAC, WISCONSIN

How to produce tomato paste



Seven Pfaudler glass-lined steel vacuum evaporators equipped with short tube heaters are used by Riverbank Canning Co., Riverbank, Calif., for making a 5 to 1 tomato paste. More are on order. Rated capacity of each unit, 12,000 lbs. per hour, although Riverbank's Superintendent reports that this has been doubled on many occasions.



This flow sheet is representative of an efficient tomato paste plant. Whether one or several tomato cookers are necessary, depends on the volume to be reduced per hour. Pfaudler is prepared to engineer the entire plant.

SEMI-SOLID or dehydrated, tomato paste is important to military and civilian requirements today. Packing maximum volume with minimum equipment and manpower is what Pfaudler Engineers have been helping U. S. packers do for many years.

The flow sheet above is typical of a continuous system for producing tomato paste (30% total solids) by vacuum evaporation. Pfaudler is prepared to engineer the entire production line. This assures a system integrated to the full economy of Pfaudler tomato cookers and vacuum evaporators.

Recently, an eastern packer came to us with a problem of making a 30% tomato paste. He had some equipment available that could be converted. Taking what he had, including boiler capacity, available water and other factors, Pfaudler designed a plant to pack 360 tons weekly. It represents an efficient operation.

But this can't be done "in a minute," especially with materials and manpower subject to priorities. So, if you are thinking of stepping up your production this year, act promptly, regardless of your problem.

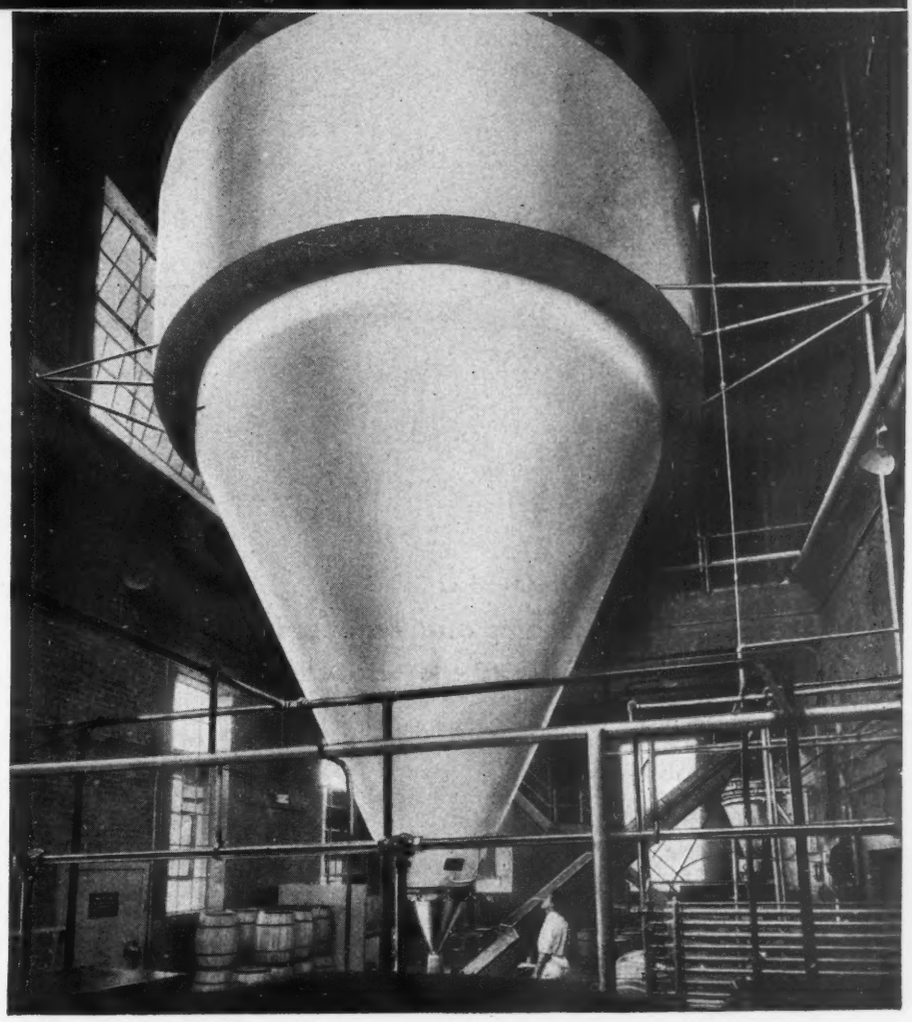
PEA BRINERS should be ordered now —If you need equipment with which to make canning brines or syrups this season, order a Pfaudler "Kwik Mix" now. Available in acid resisting glass-lined steel construction, equipped with heating coil built for 100 lbs. steam pressure. Agitator with motor drive available, if desired. Four standard sizes 60, 100, 200 and 330 gallons. Same unit can be used also as preheater for juices, cooking sauces, or cooling liquids.

PFAUDLER

THE PFAUDLER CO., Rochester, New York. Branch Offices: 330 West 42nd St., New York; 1442 Conway Bldg., Chicago, 1325 Howard St., San Francisco; 455 Paul Brown Building, St. Louis; 7310 Woodward Avenue, Detroit; 1228 Commercial Trust Building, Philadelphia; 751 Little Building, Boston; 1318-1st Nat. Bank Building, Cincinnati.

Douthitt Designed Equipment
For Flexible and Exacting Food Dehydration

The GRAY-JENSEN SPRAY PROCESS DRYING PLANT



For Victory

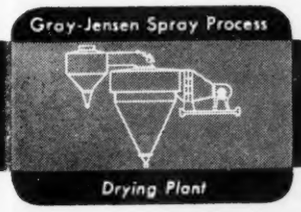
Every saving keeps down the cost of the war

The Gray-Jensen Spray Process Drying Unit offers the utmost in economies. Saves on fuel and labor. The increased efficiency throughout the entire unit produces extra quality dehydrated food products at the lowest manufacturing cost.

Gray-Jensen Plants are designed for spray-drying of whole egg, egg yolk, egg albumen, infants' foods, soup mixtures, whole milk, skim milk, buttermilk, cream, ice cream mix, malted milk and all other food products that can be reduced to liquid form and handled with pumps.

The complete unit is designed, manufactured, installed and inspected by our skilled construction and operating engineers. A guaranteed Spray Drying Unit, the Gray-Jensen, sets the standards for outstanding efficiency and economy. Investigate! Write today!

*Solubility * Full Recovery of Solids * Flavor Goodness * Keeping Quality * Economical Operation*

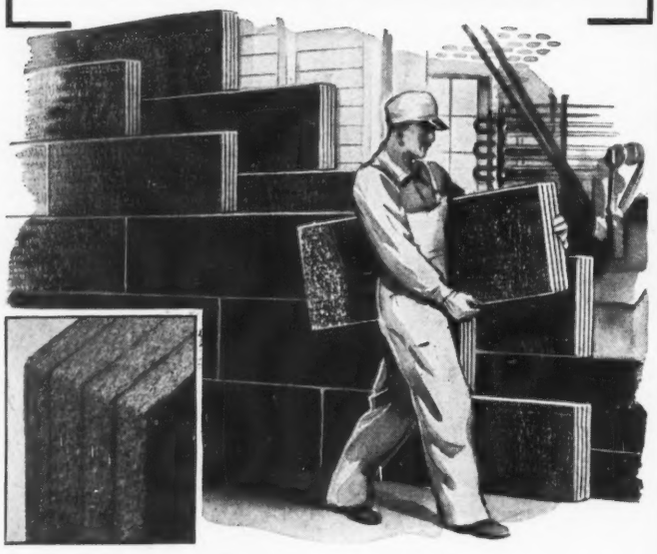


The **DOUTHITT CORPORATION**
CHICAGO, ILLINOIS

HOW THIS NEW KIND OF

Cold Storage INSULATION

simplifies your problem!



CELOTEX CELO-BLOCK

Used for Storage Rooms and Freezers in Many Army and Navy Installations

CELOTEX Celo-Block simplifies cold storage insulation problems because it is a low-density, high efficiency product guarded against moisture penetration by an asphalt exterior coating *plus* moisture barriers spaced every half inch through the material. Thus even if a break occurs in the outside membrane, its efficiency is not impaired—moisture still can't get to the inner layers!

Celo-Block is light in weight and handles easily. It is tough, not brittle. It can't chip or crumble; won't break if dropped. Shipped in cartons with special corner protection, its arrival on the job in undamaged condition is assured, which makes for fast application. And it is available NOW!

Approved by U. S. engineers, Celo-Block is now being used in food storage rooms and freezers at many Army installations, as well as in numerous industrial plants. Mail the coupon for complete information!

CELOTEX
REG. U. S. PAT. OFF.

CELO-BLOCK
COLD STORAGE INSULATION

THE CELOTEX CORPORATION • CHICAGO

THE CELOTEX CORPORATION, CHICAGO FI 3-43

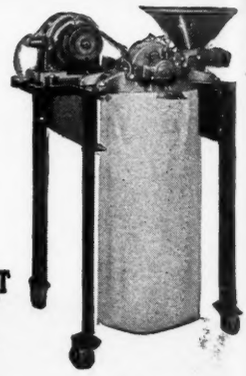
Please send complete information on Celotex Celo-Block Cold Storage Insulation.

*Name*_____

*Address*_____ *City*_____

*County*_____ *State*_____

CONSERVE FLOOR SPACE TO AVOID OR REDUCE NEW PLANT CONSTRUCTION. THE MIKRO-PULVERIZER REQUIRES LESS FLOOR SPACE THAN PULVERIZERS OF EQUAL CAPACITY.



FREE CATALOG • FREE GRIND TEST

A 32-page catalogue sent on request. And to back up the proof of the catalogue we'll make a sample grind of your materials—free.

PULVERIZING MACHINERY COMPANY
97 Chatham Road • Summit, N. J.

MIKRO-PULVERIZER
REG. U. S. PAT. OFF.

★ SPEED UP 8 DEHYDRATION PROCESSES

LA PORTE
FLEXIBLE STEEL
CONVEYOR BELTING

● **This flexible, stretchless, slipless, non-weaving and longwearing conveyor belting is engineered for peeling, slicing, coring, bleaching, draining, rinsing, drying and packing tables and other dehydration processes.**

The open mesh feature facilitates sterilizing with steam gun or scalding water.

The perfectly flat surface provides for carrying all types of containers empty or filled.

Ask your Supply House for LA PORTE Conveyor Belting in galvanized steel—available in any length and practically any width.

The LA PORTE MAT & MFG. CO.
BOX 124 **LA PORTE, INDIANA**

"I don't care if he's gone to Halifax... GET SOMEONE QUICK!"

Things really pop when refrigeration breaks down . . . and these days it's not easy to get competent assistance (or renewal parts or refrigerant) in a hurry.

Where refrigeration is vital, the York Maintenance Contract is priceless. Under this plan of *preventive* service, you are assured, first, of *continuous* operation, and second, of efficient operation that produces immediate savings in power and water costs.

York-trained experts, making regular, routine visits to your plant, keep your equipment tuned to concert pitch, anticipate your needs for renewal parts, motors, belts, valves and fittings, refrigerant, oil and insulating materials.

Before you do face a shut-down (rather than after), investigate this unique engineering service plan. Mail the coupon below so you'll have complete information in time to forestall trouble. York Ice Machinery Corporation, York, Pennsylvania.

YORK REFRIGERATION AND AIR CONDITIONING FOR WAR

HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

york refrigeration air conditioning — Certified MAINTENANCE

YORK ICE MACHINERY CORP., YORK, PENNA. F.I.-3

I am interested in lea ning more about the York Certified Maintenance Contract

Name_____ Position_____

Co. Name_____

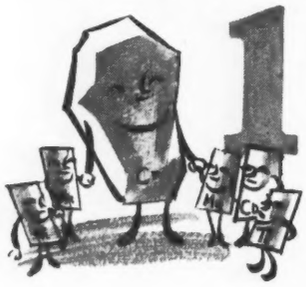
Street & No._____

City_____ State_____

Basic Facts about

STAINLESS STEELS

A STAINLESS STEEL PRIMER



STAINLESS STEELS

are corrosion-resistant steels containing at least 12 per cent chromium with or without other alloying elements, such as nickel, manganese, molybdenum, columbium or titanium. They are supplied in a wide range of analyses.

The stainless steels vary in corrosion resistance, workability, wear resistance, and physical properties according to the amount of chromium, carbon and other modifying elements present.

VALUABLE PROPERTIES INCLUDE:

Good corrosion and oxidation resistance . . . varying almost in direct proportion to the amount of chromium present.

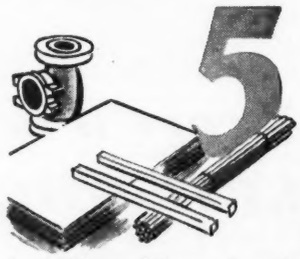
High strength-weight ratio in some cold-rolled types permitting fabrication of strong, light-weight trains, aircraft, and other structures.

MAINTENANCE

of stainless steels is simple. Washing with soap, water, and a cleanser recommended for stainless steel will keep the surface bright and free from surface deposits.

FABRICATION

is accomplished by almost all common methods. They can be machined, spun, deep-drawn, forged, punched, stamped, and otherwise mechanically-worked. They can be welded by all the common welding methods. If the austenitic steels are stabilized with columbium or titanium, and columbium-bearing welding rod is used, no annealing is necessary after welding.



MANY FORMS

are available in the common analyses including sheet, plate, strip, tubing — both seamless and welded — bars, wire, cable, welding rod, and a variety of cold-rolled shapes. Stainless steel is also supplied as foundry castings.

APPLICATIONS

of stainless steel are numerous. Because of their resistance to corrosion and oxidation, as well as their high strength and bright surface, stainless steels have been used in hospitals, chemical plants, oil refineries, railroad trains, aviation equipment, and power plants. In the present emergency, they are available only for those industries participating in war production.

• • •

Although we do not make steel, we have for more than 35 years produced "Electromet" ferro-alloys and metals used in making steel. With the knowledge accumulated from this experience, we are in a position to give impartial advice. If you have a specific problem concerning the manufacture, fabrication, or use of stainless or other alloy steels, consult us without obligation.

Electromet
Trade Mark
Ferro-Alloys & Metals

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York, N.Y.
In Canada, Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

Engineers and Manufacturers of Food

Dehydrating Equipment

also for DEBULKING and COMPRESSING

For more than a quarter-century Stokes has specialized in the development and manufacture of equipment for drying or dehydrating, for debulking and for compressing or tabletting materials into compact briquettes or tablets preparatory to packaging. Stokes engineers and laboratory facilities are now actively co-operating with government agencies, as well as with various manufacturers, in developing methods and equipment for the efficient processing of vegetables, meats, soups, food concentrates and specialties . . . to reduce them to the least practical bulk and retain their vital food values.

VACUUM DRYING

Stokes pioneered high vacuum drying equipment . . . builds rotary and rotating vacuum dryers of large capacity, shelf dryers, as well as vacuum pumps, vacuum gauges and other types of auxiliary vacuum equipment.

DRYING FROM THE FROZEN STATE

A process in which quick freezing and high vacuum combine to dehydrate heat-sensitive food products. Quality, flavor and vitamin content are retained. Volatile oils are not affected. Products so dehydrated, by the addition of water, are readily reconstructed . . . go into solution instantly. Suitable for processing citrus and other fruit juices, broths, food extracts, vegetables and meats. Blood plasma for our armed forces is processed by our methods.

ATMOSPHERIC DRYING

Stokes manufactures single and double-drum dryers, also flakers, for drying a wide range of materials, including thick slurries and concentrated solutions of various foods which are not injured by short exposure to higher temperatures. This equipment is continuous in operation, requires little attention, is highly efficient.

COMPRESSING AND DEBULKING

Certain of the Army's "K" Rations, Compressed Soups, Concentrated Foods, Egg Powders and many food specialties are being and can be compressed into briquette form on Stokes Tablet Machines. More than 30 models of automatic compressing machines are the result of our more than 45 years' experience in this field. This experience has made it possible to compress many products not heretofore available in tablet form. Other methods of debulking are also available to conserve shipping space.

You are invited to make full use of our engineering experience. At your disposal also is our semi-plant scale demonstration laboratory.

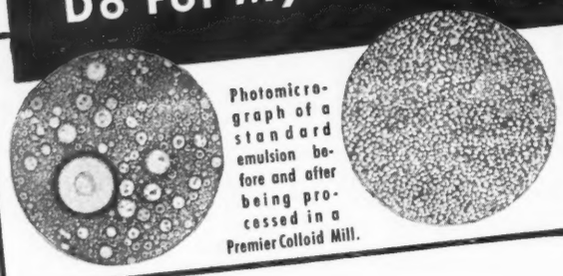
F. J. STOKES MACHINE COMPANY

5976 Tabor Road Olney P. O. Philadelphia, Pa.

Representatives in New York, Chicago, Cincinnati, St. Louis, Cleveland, Detroit
Pacific Coast Representative: L. H. Butcher Company, Inc.

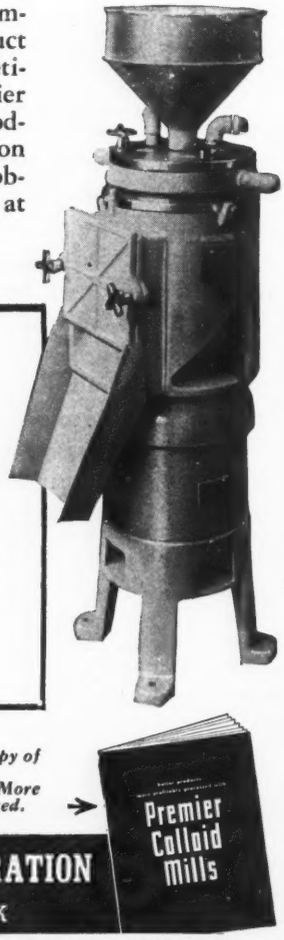
F.J.Stokes PROCESSING EQUIPMENT FJS Est. 1895

WHAT WILL
PREMIER COLLOID MILL DISPERSION
Do For My Product?



Photomicrograph of a standard emulsion before and after being processed in a Premier Colloid Mill.

Our laboratory tests of hundreds of materials prove that processers get many plus advantages in using Premier Colloid Mills. Compulsory uniformity of dispersion – reduction of particles to a fineness never before obtainable – creation of millions of interfacial contacts between the component parts of a compound – have often produced improvements in products which could be attained no other way. Explore the possibilities of Mechanical Colloid Chemistry in giving you a product which will *defy* competition. Learn what the Premier Mill can do for your products. Put your dispersion mixing and grinding problems up to the chemists at our laboratory.

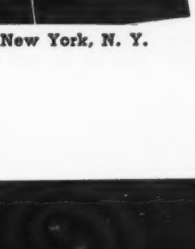


PREMIER COLLOID MILLS

For continuous operation without breakdown. Simplest rotor and stator in the world. Adjustments of clearance from .001" to .125". Economical – large output with low power consumption, lower labor cost – easy to clean.

PREMIER

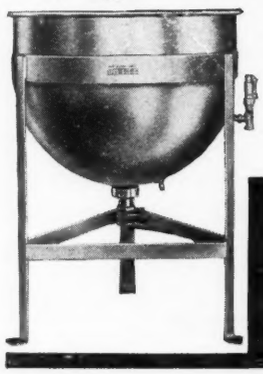
Send for FREE Copy of New Booklet F-3 Better Products More Profitably Processed.



PREMIER MILL CORPORATION
GENEVA, NEW YORK

New York Sales Office: 110 E. 42nd Street, New York, N. Y.

The PROOF OF SUPERIORITY OF LEE
PROCESSING IS IN THE FINISHED PRODUCTS!



Fine food is *better*—cooked in LEE corrosion and metallic contamination resistant Stainless Steel Kettles. Quick processing, combined with ease of cleaning makes LEE Kettles top favorites in our armed forces and essential war industries everywhere.

LEE METAL PRODUCTS CO., INC.
416 PINE STREET, PHILIPSBURG, PENNA.

LEE

IN TYPES—MATERIALS—AND DRIVES
★ *DESIGNED* for efficient service in the Food Industries ★

GUARANTEED to meet the conditions for which they are sold!

Frederick SPECIALISTS ON
PUMPS

The FREDERICK IRON & STEEL COMPANY • Frederick, Md.

Good news for your Fleet Conservation Plans

● A new "heat-fighting" oil has been developed after months of research and laboratory testing. Millions of miles of road and service tests *prove* its unusual quality.

Although civilian use of this oil is now restricted, the need for conserving fleet equipment was recognized. Standard Oil was given the "green light" to put this maintenance-saving oil on any heavy duty Diesel and gasoline powered fleet equipment. This is good news to fleet operators.

Why a heat-proofed oil? Operating temperatures in the modern internal combustion engine have greatly increased during the past few years. This has been brought about, in part, by higher compression ratios, closer clearances, and higher engine speeds. With these increased temperatures, conventional motor oils oxidize 6 to 16 times faster than they did in engines of five or ten years ago. As a result, varnish and sludge troubles appeared even on comparatively new equipment.

Motor oils were tried containing detergents which kept the oxidized parts of the oil in suspension until the oil was drained. But more protection was needed—something to keep the oil from oxidizing at high temperatures.

Stanolube H. D. was the answer. This is accomplished in Stanolube H. D. by adding to a highly refined stock, a special inhibitor developed in Standard Oil laboratories. The resultant oil has both a detergent action and unusual *resistance to oxidation.* It's a *heat-proofed* oil!

★ *heat-proofed* **Stanolube H.D.** ★

Stanolube H. D. practically eliminates troublesome varnish formation and other engine deposits. It keeps valves and rings clean, reducing maintenance, and assuring full mileage and power from your fuel. It keeps oil lines and screens from clogging, assuring a full flow of oil to the bearings, and reduces wear.

Test Stanolube H. D. in some of the hard-working units in your fleet. Compare engine cleanliness and cost of operation of these units with your other equipment.

Ask a Standard Automotive Engineer for his suggestions to help you meet ODT fleet conservation requirements. If you operate in the Middle West, there is a Standard Automotive Engineer located near you. These Engineers have been helping fleet operators for years with problems of fleet maintenance. They are doubly busy now, helping fleet men cooperate with ODT by making equipment last longer, improving tire and gasoline mileage, and reducing parts replacement. It will cost you nothing to get this service. Just write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago, Illinois, for the Engineer nearest you. In Nebraska, write Standard Oil Co. of Nebraska at Omaha.

Oil is ammunition . . . Use it wisely

STANDARD OIL COMPANY (INDIANA)

★ **FLEET CONSERVATION SERVICE**

Insulation for COLD from a Man-Made Volcano!

ACCORDING TO LEGEND, the first mineral wool was produced during an eruption of the volcano Kilauea in Hawaii. Geological survey revealed this substance to be lava, blown into soft threads by the gigantic forces of the volcano.

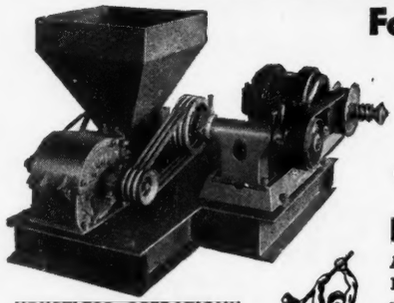
Today, at Johns-Manville factories, in man-made volcanoes, molten silica minerals are blown by means of steam into silky fibers. These mineral fibers are formed into Rock Cork, which is exceptionally efficient for low-temperature insulation. Rock Cork is immune to termites, vermin and mold. It can't rot, does not absorb odors.

Mineral wool is one of four basic materials from which all Johns-Manville products stem: Asbestos, asphalt, diatomaceous earth and mineral wool. Today, Johns-Manville has but one aim: To make these products in the quantities needed to help win the war. Johns-Manville, 22 East 40th Street, New York, N. Y.

JM

Johns-Manville
ROCK CORK

GRUENDLER CRAFTSMANSHIP
Employed by U.S.A. in the WAR EFFORT



Food Processing Equipment

Meeting Different Products and Capacity Requirements

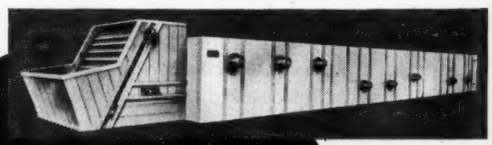
"DUSTLESS OPERATION"
Requiring no auxiliary separators, fans or collection attachments. "Built in Many Sizes"

"Illustrated Bulletin on Request"

MASTER PULVERIZER
Adjustable from 30 mesh to 100 mesh and finer—a most popular type of pulverizer for food products, cocoa, sugar, grains, spices, whole wheat flour grains, etc.—Write our Engineers.

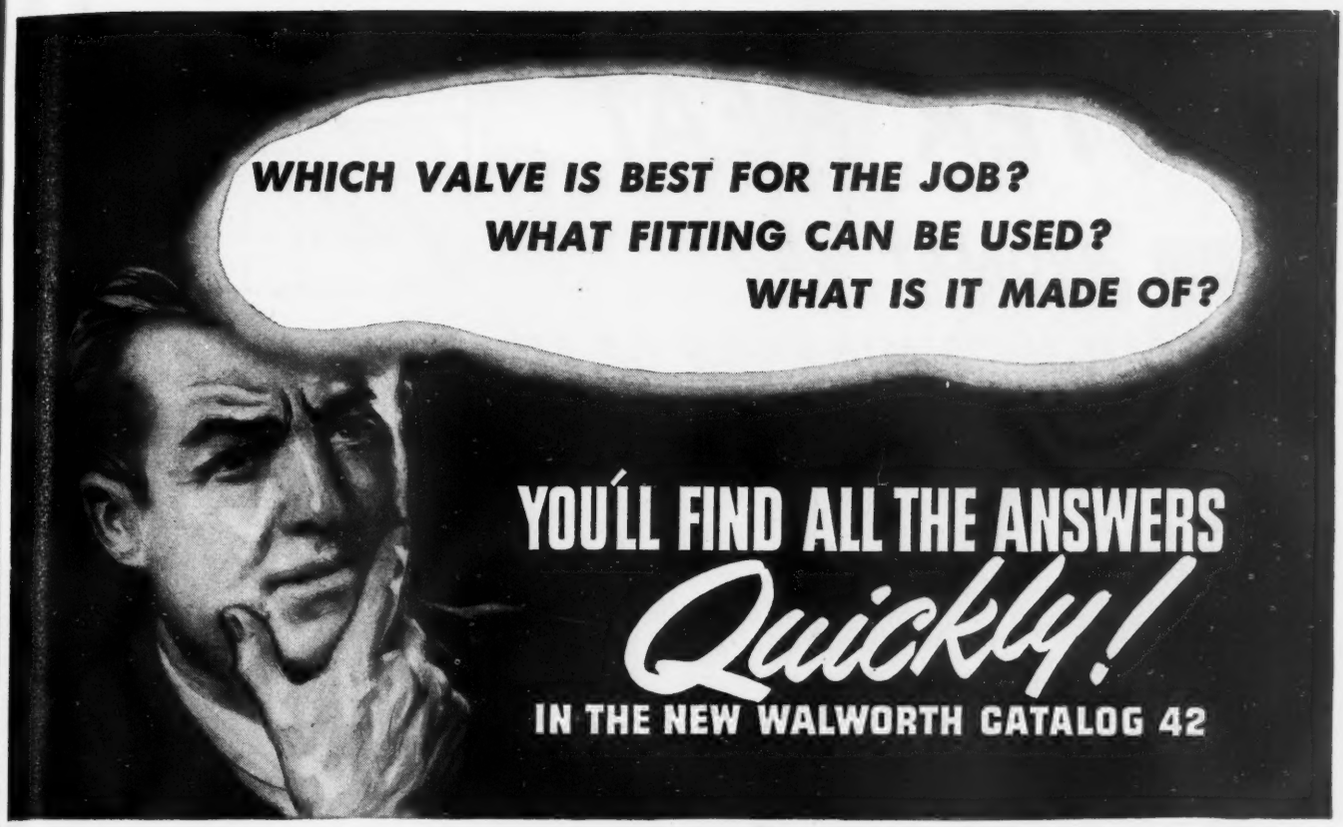
GRUENDLER CRUSHER & PULVERIZER CO.
PLANT and MAIN OFFICE — 2915-17 N. MARKET • ST. LOUIS, MO.

THE NEW PROCTOR FOOD DEHYDRATOR



— is now in successful operation and turning out the very highest quality results. It is entirely automatic in operation...operating costs are extremely low...capacities are up to 30 tons of raw product per 24 hours...and only 1 man is required to operate it. For riced, strip, julienne, diced or cubed potatoes ...sliced and diced carrots...diced beets...diced turnips...diced rutabagas . . . sweet potatoes . . . meats, etc.

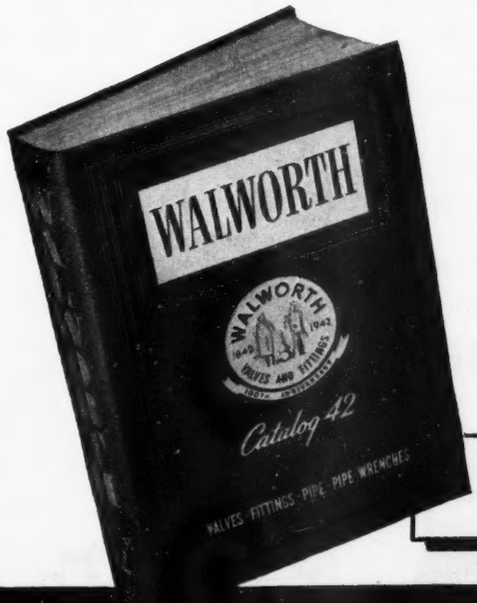
PROCTOR & SCHWARTZ · INC · Philadelphia


WHICH VALVE IS BEST FOR THE JOB?
WHAT FITTING CAN BE USED?
WHAT IS IT MADE OF?
YOU'LL FIND ALL THE ANSWERS
Quickly!
IN THE NEW WALWORTH CATALOG 42

Be right the first time and every time—specify the exact Walworth valve, fitting, pipe, and tool you need from this new Walworth Catalog 42. Complete and up-to-date information is given on every Walworth product to help you save time in ordering.

Pressures, dimensions, engineering data, and other helpful information are given in clearly indexed sections of the Catalog.

If you haven't your copy of the Walworth Catalog 42, fill out the coupon and mail it today. Transportation priorities may slow up deliveries, so allow a little more time than usual for shipment of your copy.



Metals — Complete data on all metals used.

Pressures — Working and test pressures, plus service recommendations.

Dimensions — Complete for layout and operation, with cross sections to clarify internal construction.

Telegraphic Code — Carefully indexed to simplify and speed up accuracy in specifying.

Engineering Data — Charts, tables, formulae to make valve and pipe installations easier.

USE THIS COUPON

Address your inquiry to Dept. **32**, *Walworth Co., 60 East 42nd St., N. Y. C.*

Please send a copy of the new Walworth Catalog 42 to:

*Name*_____

*Title*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

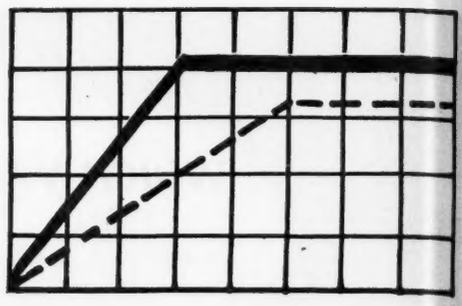
WALWORTH

WALWORTH COMPANY
60 EAST 42nd STREET, NEW YORK

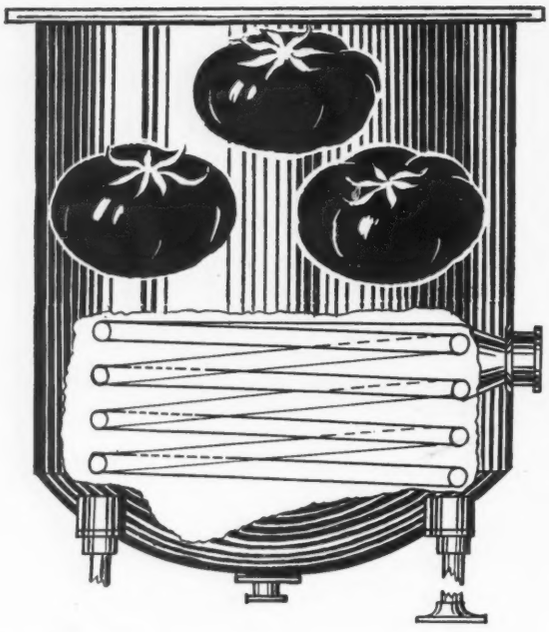
VALVES FITTINGS and TOOLS
Backed by 101 Years' Service

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

FASTER HEAT



FROM PROMPT AND THOROUGH ELIMINATION OF AIR AND CONDENSATE



THE CASE OF THE

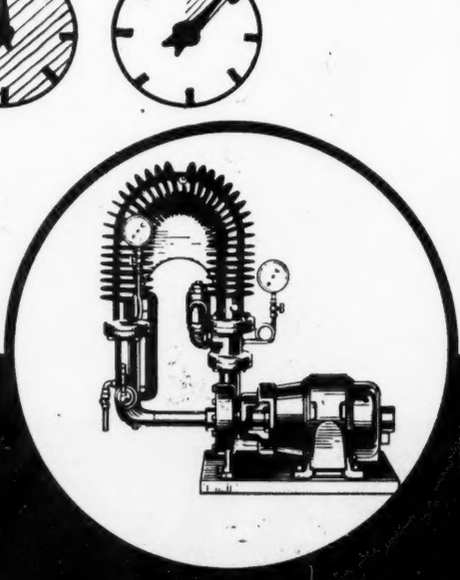
TOMATO KETCHUP MANUFACTURER

PLANT No.1-2 COCHRANE BECKER SYSTEMS
PLANT No.2-1 C-B SYSTEM
PLANT No.3-1 C-B SYSTEM

BEFORE: STANDARD TIME FOR "BREAK" 180 SECONDS

AFTER: INSTALLATION OF COCHRANE-BECKER SYSTEM 70 SECONDS

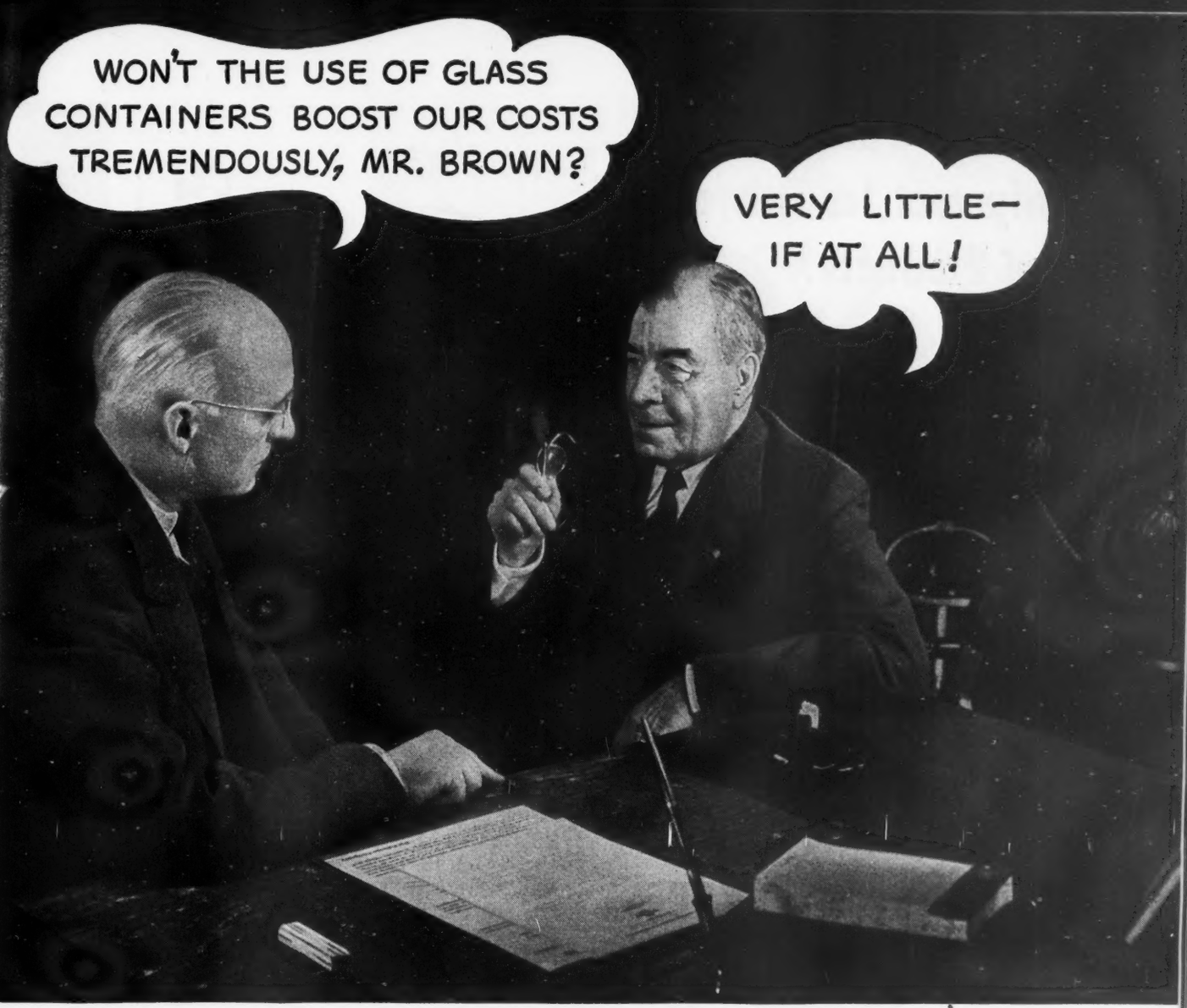
28% TIME SAVED + { 16% FUEL SAVED; 28% PROD. INCREASE; 22% LOWER LABOR COST



WOULD YOU LIKE TO OBTAIN RESULTS LIKE THIS?
WRITE COCHRANE CORP. 3117 N. 17th ST. PHILA, PA.

COCHRANE-BECKER

System of High-Pressure Condensate Return



Glass packaging costs are today lower than ever! The lighter weight and greater strength of modern glass containers—plus standardization of shapes and sizes—make possible high speed mass production. You enjoy valuable savings in initial cost, shipping and handling.

In addition, conversion of packaging lines is simpler and more economical than generally surmised. Frequently, present filling, labeling and conveyor equipment can be used—following minor alterations by your own mechanics.

To protect products packed in Anchor Hocking's complete line of food containers, fourteen Anchor Metal and Molded Closures are available. Whether you require an airtight or a vacuum seal, there's an Anchor Cap to do the job! Write for sample containers, closures and liners. State capacities desired.

R. B. BROWN, one of Anchor Hocking's ablest and most popular men, has been a member of the Anchor Hocking family for 36 years.

ANCHOR HOCKING

GLASS & CAPS

ANCHOR HOCKING GLASS CORPORATION LANCASTER, OHIO

Essential Packaging Equipment for Dehydrated Food Products..

EXACT WEIGHT Shadowgraph scales check-weighing powdered egg products in the Cracker Jack factory, Chicago, Ill.

Fruits, Vegetables, Meats, Eggs . . .

Scarcity of labor, short transportation space, and lack of tin for canning have forced new processing methods . . . revolutionary new packaging of dried fruits and vegetables, dehydrated meats and powdered eggs. No commodities thus far created by man and necessity lend themselves more completely to modern EXACT WEIGHT packaging than do these new food products. What is required is handling smaller containers, light in weight, with speed and accuracy. EXACT WEIGHT Shadowgraphs, electrically operated, are ideally fitted for this task of volume production in short efficient day and night shifts with profitable results. This is essential equipment for vital food output.

Write for full details for your packaging operations.

THE EXACT WEIGHT SCALE COMPANY

21 W. Fifth Ave., Columbus, Ohio

Exact Weight Scales

THE FOOD INDUSTRY IS SOLVING TOMORROW'S EQUIPMENT PROBLEMS TODAY!

We feel KOVEN can claim a share in the progress the food industry has made in meeting the emergencies of war. When revolutionized processes call for rapid conversion of equipment, KOVEN is ready with over 50 years experience in solving individual equipment problems and building equipment to specification.

But changes created by war in the food industry are only preliminaries to the changes that will come in peacetime when today's developments are put to general consumer use. KOVEN engineers are planning ahead for these possibilities and the equipment conversion they will involve, so that when peace comes we will be prepared to help you solve your new equipment problems.

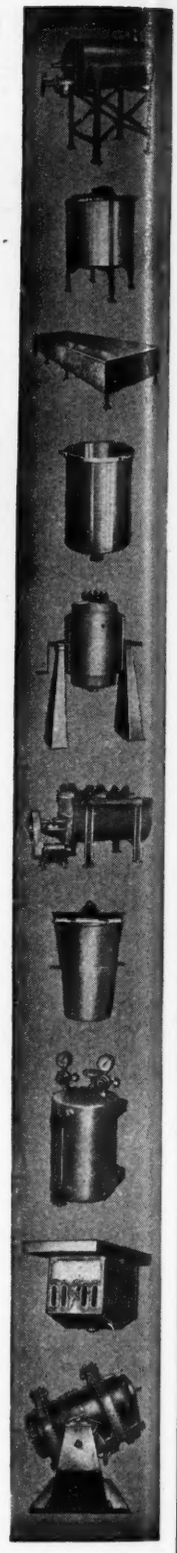
If you have either an equipment problem today, or an idea for the improvement of your equipment for tomorrow, phone or write to have our representative call on you. A consultation with him obligates you in no way.

Among the many KOVEN products:

Stainless Steel
Aluminum Sheet Fabrication
Boxes, Tote, Waste Cans
Chemical Apparatus
Coils and Pipe Bands
Copper Sheet Fabrication
Galvanizing Work
Kettles, All Types, All Metals
Mixers, All Kinds
Monel Metal Fabricator
Pails, Special Heavy
Pans, All Types, All Metals
Sinks, Scullery, and Factory
Tables, Galvanized or Monel
Tanks, All Types, All Metals

WATERFILM Industrial Heating Boilers

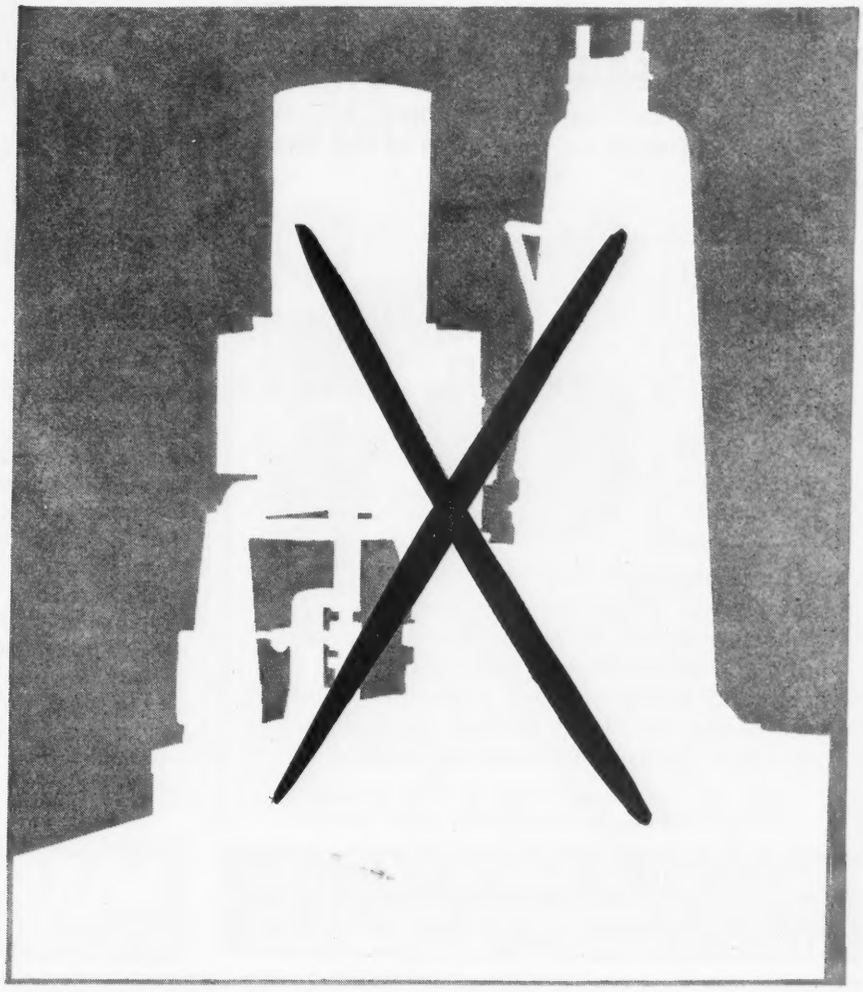
PLANTS
Jersey City, N. J. Dover, N. J.



L. O. KOVEN & BRO. INC.

154 Ogden Avenue
JERSEY CITY, N. J.

X Marks the Spot



. . . and a hot spot it was—Wright's Humidor Packer for automatic packaging of dehydrated foods in pasteboard cans. Now temporarily blanked out while our facilities are directed toward keeping our boys in the Solomons, Tunisia and points in between, supplied with the finest equipment that only our 50 years of engineering experience and skill can produce.

But this war job we are doing is accelerating our technical progress, increasing our productive facilities and stimulating our inventive genius for the peaceful years ahead.

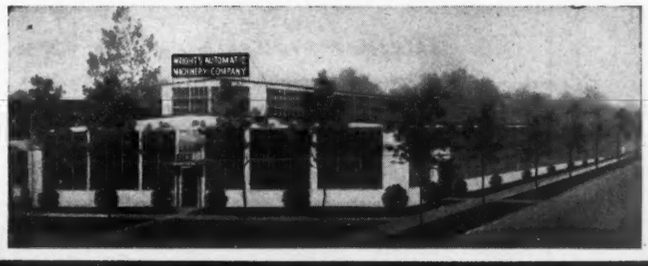
We'll be ready when the time comes—and in the interval our service department is committed to keeping every piece of Wright Equipment functioning at peak efficiency.

WAR SAVINGS BONDS

EVERY PAY DAY

Wright's more than 700 employees are signed 100%—are contributing 12.6% of total salaries and payroll.

ESTABLISHED • 1893 •



PACKAGING ENGINEERS

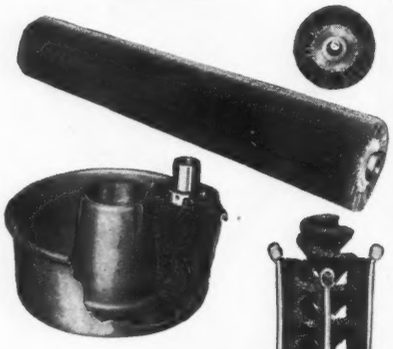
WRIGHT'S AUTOMATIC MACHINERY COMPANY

DURHAM CABLE ADDRESS YONWRIGHT NORTH CAROLINA, U. S. A.

FULLERGRIPT BRUSHES

MEET THE NEEDS OF DESIGNERS, BUILDERS AND USERS OF MACHINERY IN THE FOOD INDUSTRY

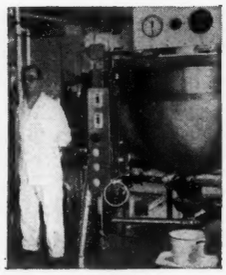
FULLERGRIPT Brushes for
BAKERIES
DAIRIES
FLOUR MILLS
MEAT PACKING
FRUIT GRADING
CANDY—ETC.



TO manufacturers and processors of Food: Wherever you use Brushes, consider Fullergript's enduring construction. Conveying equipment, wrapping and packaging, bottling and labeling machinery operate more efficiently with these sturdy, long wearing Brushes.

Also try our standard line of Floor Brushes, Dusters and the famous FULLER FIBER Broom.

The FULLER BRUSH Company
Industrial Division, Dept. 8C
3592 MAIN STREET · HARTFORD, CONN.



CHEMICAL AND FOOD PLANTS

all Sarco

Chrome-nickel equipment everywhere, and dozens of cookers, mixers and agitators, all equipped with Sarco No. 9 Thermostatic Steam Traps make this New York plant an outstanding example of streamlined efficiency.

The Sarco No. 9 is noted for its ability to extract all the usable heat before its wide ports open to release the condensate. It is small, low cost, works at all pressures, and is ideal for use on each coil of batteries of steam equipment in the food, process and chemical industries. Ask for Catalog No. 250.

152

SARCO SAVES STEAM
SARCO COMPANY, INC.
475 Fifth Avenue, New York, N. Y.
Sarco Canada Ltd., Federal Bldg., Toronto, Ont.

POSITIONS VACANT

MANUFACTURER interested having experienced men making syrups, gelatin desserts, other specialties. Permanent position; excellent opportunity for advancement. When writing, give complete details. P-108, Food Industries, 330 W. 42nd St., New York, N. Y.

WANTED—FOOD CHEMIST experienced in canning trade, both fruits and vegetables. P-119, Food Industries, 68 Post Street, San Francisco, Cal.

WANTED—CHEMIST and Bacteriologist experienced in the food field for position as Director of laboratory operated by national association. Preference given to man familiar with soft drink industry, and capable of addressing meetings and writing for publication. Apply in writing, giving brief history, references, salary, and draft status. Address American Bottlers of Carbonated Beverages, 1128 Sixteenth Street, N. W., Washington, D. C.

DAIRY LABORATORY TECHNICIAN, preferably experienced, with academic training in dairy manufactures, bacteriology and chemistry. Send full details as to education, experience, draft status and salary desired to N. J. Dairy Labs, 226 Easton Ave., New Brunswick, N. J.

POSITION WANTED

TRAINED milk and food sanitarian. Three years commercial six years Public Health experience. Desire position in dehydration or frozen foods plant or laboratory. Married, two children, draft 3A. PW-118, Food Industries, 520 N. Michigan, Ave., Chicago, Ill.

WANTED

NAILING MACHINES WANTED—We want Morgan or Doig Nailing Machines at once. State make, size, best cash price. Chas. N. Braun Machinery Co., Fort Wayne, Indiana.

SEARCHLIGHT SECTION

EMPLOYMENT : BUSINESS : **OPPORTUNITIES** : EQUIPMENT : USED OR RESALE

UNDISPLAYED—RATE PER WORD
10 cents a word, minimum charge $2.00 an insertion.
Positions Wanted (full or part time salaried employment only ½ the above rates.
Box Numbers in care of any of our New York, Chicago or San Francisco offices count 10 words. No additional charge for forwarding replies.
Discount of 10% for payment in advance on 4 consecutive insertions of undisplayed advertisements.

DISPLAYED—RATE PER INCH
The advertising rate is $6.00 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
An advertising inch is measured ⅞" vertically on one column, 3 columns — 30 inches—to a page.
NEW ADVERTISEMENTS
must be received by 10 A. M., March 24th for the April issue subject to limitations of space available.

SELLING OPPORTUNITIES
OFFERED—WANTED
Selling Agencies—Sales Executives
Salesmen—Additional Lines

PRIME **LOANS** TO
CORPORATIONS and INDIVIDUALS
Unsecured or Collateralized
LARGE Sums—LOW annual rates.
COLLATERAL DISCOUNT CORP.
Graybar Bldg.—New York City

Flat Spiral Reinforced
BLOCK TIN COIL
For Sale
90 lineal feet 1" I.D.—.295 wall.
5' overall diameter
Mearl Corp., Eastport, Maine

Food Plant Equipment For Sale
Write for Details
FS-115, Food Industries
330 West 42nd St., New York City

SALESMEN AVAILABLE

SALESMAN; thirty years food industry experience; sales management. Acquainted jobbers, chains, buyers, mid-western, southwestern, southeastern states. Draft deferred. SA-120, Food Industries, 520 N. Michigan Ave., Chicago, Ill.

SALES MANAGER will leave present employment to accept several established lines on commission for the duration. This is a chance for related products, non-competitive manufacturers to pool sales representation now and get competent help of mature operator; family man; over draft age. Headquarters: Washington, D. C. SA-117, Food Industries, 330 W. 42nd St., New York, N. Y.

FOOD PRODUCTION WILL WIN THE WAR!

No doubt it is becoming increasingly difficult to maintain full scale production because new machinery requires not only high priority but months of waiting. REBUILT EQUIPMENT is available immediately. Check our stock for your needs. Here are a few selected items.

250—New and rebuilt Jktd. Kettles in Stainless Steel and Copper up to 500 gals.

1—National Pkg. 2 Station auger type, aut. Powder Filler

1—Stokes & Smith, Model G 1—aut. auger type Filler

3—Filler Machine Co. 4 and 6 Spout Piston Fillers

4—M. & S. 4 and 6 Spout Piston Fillers

15—New and Used Dry Powder Mixers up to 2000 lbs.

2—Micro Pulverizers 24"; with 60 HP and 75 HP motors

3—Orville Simpson Rotex 40" x 84" Sifter Screens

15—Labelers, World, Ermold, National and others

10—Knapp and Burt Can Labelers

3—Pneumatic Scale 6 Head Cappers; 3 Cap em Cappers

30—Large Steel Storage Tanks up to 17,000 gallons

6—Copper Jacketed Vacuum Pans from 30 gal. and up

1—300 Gal. Glass Lined Jacketed and Agitated Vacuum Pan

4—200 Gal. Glass Lined Agitated Tanks

1—24" x 24" Shriver Plate & Frame Filter Press; 28 Jktd. Plates

12—Steel Jacketed 1000 gal. Agitated Tanks

Large Stock of Liquid Fillers by Karl Kiefer, Ayers, Progressive, Standard Automatic, etc.

FIRST MACHINERY CORPORATION

GUARANTEED EQUIPMENT — F M C — LIQUIDATORS APPRAISERS

EAST 9th STREET and EAST RIVER DRIVE — GRamercy 7-6622 Cable EFEMCY — NEW YORK, N.Y.

Several Complete Food and Packing Plants Available for Sale. Send for Details and Specifications on Any Item Listed Above.

FOR SALE

DRYERS

3—Atmospheric Double Drum, 3' x 8', 4' x 9'
7—Rotary, 3' x 18', 3' x 30', 4' x 30', 5' x 35', 6' x 65', 6' x 100'
1—Rotary Indirect, 6' x 45', monel lined
2—Hersey Rotary Indirect 5' x 25', 6' x 25'

KETTLES—PANS—AUTOCLAVES

1—3' Stokes Copper Vacuum Pan, agitated
1—Buflovak Impregnating Kettle, 42"x60"
5—Copper Vacuum Pans 2', 2'6", 7' dias.
25—Copper Jcktd. Kettles, 10 to 300 gals.
9—Steel Jcktd. Kettles, 50 to 2000 gals. agitated
4—Autoclaves 5, 25, 80, 150 gals.

CENTRIFUGALS

1—Weston 40" Suspended, with 40 HP AC motor
3—Tolhurst 40" Suspended, with 15 HP AC motors
5—Tolhurst 32", 40", 48", self-balancing type
6—Sharples No. 6
1—Sharples Lab. Centrifuge
4—DeLavel Nos. 200, 500, 600, 700

MIXERS

2—Day No. 30 Imperial, Jcktd., 75 gal. working capacity
5—Change Can, 8 to 40 gal.
1—Day Universal, Jcktd., 265 gals.
20—Day Powder Mixers, 25 to 2000 lbs.
5—Hobart and Century Vertical Cream Mixers
6—Ross, Day, Read, W. & P. Trough Mixers, Lab. to 350 gal.

FILTERS

3—12" Ertel Disc Filters
1—Sperry 32"x32", cast iron, closed delivery, 26 chambers
1—Sperry 36"x36", cast iron, 41 chambers
10—Shriver Skeletons, 12" to 36" square
8—Kilby 30"x30", cast iron, 38 chambers
5—Oliver Rotary 8' x 2', 6' x 4', 12' x 8'
3—Sweetland Filters, Nos. 5, 7, 10

PULVERIZERS—GRINDERS

1—Mikro 24", motor driven
4—Raymond No. 0000, 00, 1
7—Hammer Mills, Williams, JayBee, Jeffrey, 5 to 100 HP
5—Mead Mills, Nos. 1, 2, 3
1—Schutz O'Neill No. 3 Sugar Mill
15—Pebble Mills, Lab. to 300 gal.
6—Roller Mills, Lab. to 16" x 40"
6—U. S., Premier Colloid Mills, ½ to 100 HP
3—Schutz O'Neill Mills, 20" to 28"

TANKS

3—Copper, 2000, 2500 gals.
10—Glass Lined, 50 to 1000 gals.
5—Sectional Brewery, 8' to 9' dia.
15—Steel Storage, 3500 to 15,000 gals.
2—20' x 20' Open Top Steel

FILLING & PACKAGING EQUIPMENT

3—Stokes, Stokes and Smith Powder Fillers
2—Kiefer Visco Fillers
4—Knapp, Burt Can Labelers
10—Ermold, World, National Semi-Automatic Labelers
2—World, International Automatic Labelers
1—Kiefer 8 spout Vacuum Bottle Filler
2—Kiefer 18 spout Rotary Bottle Fillers
5—Stokes, Colton Jar Fillers
1—Pneumatic Scale Packaging unit
1—Pneumatic Scale 6 Head Automatic Capper
1—Capem Single Head Automatic Capper

MISCELLANEOUS

2—Mustard Mills, high speed, colloid type, with pumps
20—Rotary and Centrifugal Pumps, 1 to 6"
1—S. & K. 27 sq. ft. Heat Exchanger
1—Badger 1000 gal. Copper Still
5—Rotex, Tyler Screens
4—Tablet machines ¼ to 1½" dies

YOUR INQUIRIES SOLICITED.

SEND US YOUR LISTINGS.

BRILL Equipment Co.
183 VARICK STREET NEW YORK

3—Degreasing Ovens, 7'6"x6'x15'; 9'x8'x15'

10—Sharples Pressurite Super Centrifuges, with Motors.
1—Stainless Steel Extractor, 36" basket.
1—Two-Truck Dryer.
1—Louisville Rotary Steam Dryer, 6'x50'.
2—Louisville Rotary Dryers, 6'x50'.
1—Rotary Crystal Dryer, 5'x26'.
1—Black & Clawson Two-Drum Dryer, 28"x60".
1—Devine Rotary Vacuum Dryer, 3'x15'.
1—Zahn & Nagel 60 bbls. Kieselguhr Filter, 24", 14 leaves.
1—Sweetland #7 Filter Press.
1—Shriver 12x12" Lead Filter Press.
1—Sperry 12x12" Aluminum Filter Press. .
1—Stokes Evaporator, 52x9'.
5—Kilby Single-Effect Evaporators, brass tubes.
1—Single-Effect Evaporator, copper tubes.
2—Jacketed Stills, copper & steel, 50-gals., 5-gals.
2—Griscom-Russel Condensers, brass tubes.
4—W & P Mixers, 2 qts. to 100-gals.
2—Steel Jacketed Mixers, 4½' x 8½'.
2—Aluminum Jacketed Tanks, 2'x5', 10" cone.
1—Goats Capping Machine.
2—World Labellers. #10.
1—Karl Kiefer 6-spout Bottle Filler.

R. GELB & SONS, Inc.
Est. 1886
Union, N. J. UNionville 2-4900
(Send for "Gelb News Record").

Davidson Wet Vacuum Pump 3½ x 4 x 4.

Several used Copper Steam Jacketed Kettles.

3 HP Elec. Motor D.C. 575 rpm perfect.

THOMAS BURKHARD, Inc.
494-496 Flushing Ave., Brooklyn, N Y.

TIME is a WAR ESSENTIAL

SAVE TIME . . . GET YOUR EQUIPMENT NOW—from "CONSOLIDATED"

1—Pneumatic Scale Packaging Unit.
1—Pneumatic Scale Automatic Wax Liners.
7—300 gal. Copper closed tin-coated Tanks.
1—J. H. Day #2 Brighton Mixer, 80 gal. cap.
6—8 to 40 gal. Pony Mixers.
15—Dry Powder Mixers, from 50 to 4000 lbs.
1—Stokes & Smith auger type auto. Power Filler.
2—80-qt. Century 4-speed Mixers, m.d.
1—Buffalo 48"x40" Bronze Rotary Vac. Drum Dryer.
1—26"x60" double drum Dryer, comp.
3—Buffalo 17-shelf Vac. Shelf Dryers, 42x42".
1—Buffalo 24" Vanilla Bean Chopper.
1—World 1-Ermold semi-auto. Labeling Machines.
2—Karl Kiefer Visco Filling Machines.
1—Johnson mod. JA Cellophane Wrapper.
11—Filter Presses P & F; Recessed; to 42" Square.
2—World Rotary Automatic Labeling Machines.
2—Mechanical 4x9' Lard Rolls, m.d.
1—#6 Sweetland Filter, 12 bronze leaves, 3" c.c.
17—Stainless Steel, Copper, Aluminum; Glass Lined; Kettles and Vacuum Pans, up to 550 gal. cap.
2—Schultz-O'Neil Pulverizers.
1—54"x45" Monel Lined Direct Heat Dryer.
3—K.K. & U.S. Rotary bottle Rinsers, m.d.
2—Premier 5" and 10" Colloid Mills, m.d.
1—5x35' Louisville Steam Tube Dryer.
1—Elgin 12-spout Rotary Piston Filler, S.S.
12—Copper Tanks to 5000 gal.
1—Johnson T & B Sealer Unit.
1—36" x 84" Double Drum Dryer.
2—O. & J. 7-place Rotary Labelers, m.d.
1—Stokes 500 gal. Copper Jack. agitated Vacuum Pan.

● *Send for "Consolidated News" listing complete stock.*

We buy and sell from a Single Item to a Complete Plant
CONSOLIDATED PRODUCTS CO., Inc.
Office: 13-17 PARK ROW, N. Y. Shops: 335 DOREMUS AVE., NEWARK
Buy With Confidence — "Consolidated"

WANTED

WANTED

Food Machinery continuous vegetable peeler
3—large size Sterling Potato Peelers
1—Rotary Tomato Washer
1—Niagara Tomato Washer
1—Tomato Washer Similar to Sprague Model 15-C
1—24" wide elevator that will handle tomatoes, should elevate at least 10 feet
1—24" or 30" wide inspection table 20 to 30 feet long, can be rubber, La Porte chain or roller type
1—Urschel Potato slicer
1—Langsenkamp hot break tank for tomato juice or Food Crusher Preheater
1—Langsenkamp Model A juice extractor or Food Machinery juice extractor
1—1½ or 2" Viking Pump for handling juice, prefer motor dr. with var. speed
1—Tomato juice strainer
Juice filler for handling #10 cans
Juice filler for 46 oz. and smaller
Pre-heating tank for juice before filling
1—rod reel washer
3—1 H.P. Electric Motors either single or 3 phase A.C. with gear in head

S. E. W. FRIEL
Phones 2111-2121, Queenstown, Md.

FOR SALE

1—Berlin-Chapman 15-pocket Syruper and Filler.
3—Lard Rolls, 3x6' and 18x48".
2—Automatic Screw Capping Machines.
5—Attrition Mills—18, 22 and 30".
1—2-roll Raymond Roller Mill.
2—Karl Kiefer Visco Fillers.
1—Urie Universal Filler.
6—#300 and #600 DeLaval Clarifiers.
2—#3 and #5 Sweetland Filler.
5—Copper Tanks—150 to 800 gal.
2—Rotary Bottle Rinsing Machines.
2—M&S Universal Filling Machines.
1—#6 style B Peerless rotary Exhauster.
6—20 gal. Jack. Copper Tilting Kettles.
Dough and Powder Mixers, Bottle and Can Fillers, Filters, Filter Presses, Mills, Dryers, Pumps, Boilers.

Send us your inquiries, also your list of surplus equipment, which we purchase for cash.
LOEB EQUIPMENT SUPPLY CO.
908 N. Marshfield Ave. Chicago, Ill.

FOR SALE

2—200 gal. S. S. Tanks, jkt., agit.
60 gal. Pfaudler Evap. Kettle, 48x16.
200 gal. Pfaudler Tank, jkt., 38x42.
300 gal. Pfaudler Tank, insul., 42x50.
3—300 gal. Pfaudler Tanks, jkt., agit.
550 gal. Pfaudler Tank, horiz., 48x72.
1250 gal. Pfaudler Tank, 54x124.
1500 gal. Pfaudler Tank, 54x144.
2000 gal. Pfaudler Tank, horiz., 84x84.
6—J. H. Day Post Mixers, s. s. paddles, 115 gal. Glass Lined Tanks.
70 gal. Copper Still, 26"x36", coil.
150 sq. ft. Tubular Condenser, brass tubes.
1" Ingersoll Rand Pump, 2 H.P.
60 to 400 gal. Homogenizers or Viscolizers.
Large Stock of Milk and Ice Cream Plant Equipment.

Send Us Your Inquiries

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street New York, N. Y.
MUrray Hill 2-4616

WANTED

Wanted to buy for cash, Dutch Processed Cocoa in any quantity from 1 barrel to car lot, or your unused quota of Cocoa or Chocolate.

BRADWAY CHOCOLATE COMPANY
New Castle, Indiana

AVAILABLE NOW!

2 SHARPLES #6 Super Centrifuges, Monel and Stainless Steel Bowls
2 Auger Fillers, STOKES & SMITH and TRIANGLE Sifters and Mixers, 50 to 2000 lb.
2 Wood Plate and Frame Filter Presses, 18" and 24"
SWEETLAND # 1 Filter Press, bronze screens
STOKES Surface Condenser, 75 sq. ft. surface
STOKES Vacuum Pump and 5 HP motor, 50 cfm
AMERICAN Model B Juice Extractor
ROTEX Sifter, 20" x 48", M.D.
STANDARD KNAPP Compression Unit, M.D.

List your surplus with us!

MACHINERY & EQUIPMENT Corporation
59 E. 4th ST. N.Y.C.

For Sale

1 Vertical 2100 gallon Pfaudler Glass-lined Steel Tank with Jacket, Agitator, Gear Box.

Excellent condition.

E. R. JAGENBURG
247 Herkimer Street, Brooklyn, N. Y.

WANTED

Pneumatic Scale or Stokes & Smith-Automatic Powder Filling and carton gluing equipment—to handle cartons 4" x 3" x 2" approximately.

PURITY DRUG CO., INC.
178-204 River Drive Passaic, N. J.

FOR SALE—USED AND RECONDITIONED

Roller gravity conveyor; Bottle and jar chain belt conveyor M.D.; chain conveyor for cases and cartons M.D.; belt conveyors, horizontal and inclined M.D.; bar-types boosters M.D.; spiral chutes, slide and roller bed; special conveyors; large stock; quick deliveries.

Island Equipment & Supply Co., Inc.
101 Park Ave., New York, N. Y.

HIGH PRICES

Send us your list of machine tools, electric motors or other idle equipment for prompt action.

GEORGE GALES
1133 Broadway New York City, N. Y.
Tel—CHelsea 3-3600

WANTED

EQUIPMENT WANTED

Used equipment of all types and size. Will PAY CASH and remove immediately! Write or wire collect, giving full description and lowest cash price!

UNION STANDARD EQUIPMENT CO.
318-322 Lafayette Street New York, N.Y.

FOR SALE

SPRAY DRYING EQUIPMENT

Large spray drier, including high pressure boiler, pump, motors, etc. Immediate delivery.

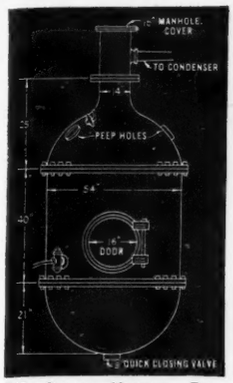
FS-114, Food Industries
330 W. 42nd St., New York, N. Y.

FOR SALE!

2—Langenskamp #10 Rotary Catsup Fillers. Can be used for any similar product. $400.00 each.

FS-116, Food Industries
330 W. 42nd St., N. Y. C.

SEARCHLIGHT SECTION



54" Copper Vacuum Pan, jacketed, complete with condenser, vacuum pump, etc., also 20 to 300 gal. sizes

SPECIAL!

Package Machinery Co., high speed wrapping machine for all types and sizes of bars, cakes and boxes.

Johnson Automatic Unit, for setting up, filling, closing and wrapping cartons, complete with inter-connecting conveyors.

Gruendler No. 2 Peerless Hammer Mill, equipped with roller bearings for motor drive.

J. H. Day, 3 Roller Mill 12"x32" Water Cooled Rollers Equipped with Silent Chain Motor Drive.

National Equipment 6 ft. Melangeur with granite rolls 28" in diameter by 16" wide.

Allis Chalmers No. 4 Centrifigal insulated, dust proof cleaner, with non-static reel.

Standard Automatic Carton Sealing and Gluing Machine.

Wolf Steam Dryers consisting of 6 steam jacketed tubes with spiral ribbon conveyors.

IN STOCK . . . READY FOR IMMEDIATE DELIVERY!

ALL OFFERINGS SUBJECT PRIOR SALE!

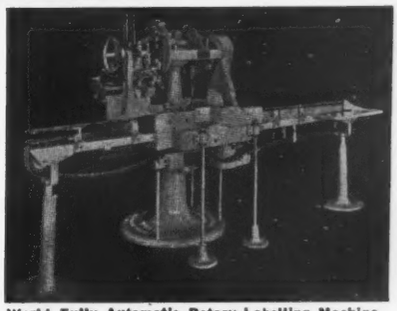
Wire Collect For Prices & Details!

MIXERS

Werner & Pfleiderer 2,500 gal., double arm jacketed Storage and Mixing Tanks
Read 250 gal. Mixer, jacketed, double arm, with tilting device
J. H. Day 50, 100, 150 and 250 gal. cap. Mixers, single arm, jacketed, with power tilting device
J. H. Day Dry Powder Mixers, size D, 600 lb. cap., with enamel lined tanks, also other sizes from 100 lbs. to 600 lbs. with wood tanks
Glen Power Plus Mixer, 100 qt. cap.
Day and Read 3-speed, vertical Mixers, with 80 qt. cap. removable bowls
1,000 gal. cap. jacketed Mixing and Storage Tanks, vertical type

BOTTLE AND JAR FILLING AND LABELLING MACHINES

Filler Machine Co. Filling Machines
Ayars 10 spout Rotary Liquid Filling Machines
Karl Kiefer Automatic Vacuum Filling Machine with feed and discharge conveyor
U. S. Bottlers 10 spout Model C-10 Filling Machine, 4 to 16 oz. cap.
U. S. Bottlers Accurate Measure Fillers, 6 and 8 spout
World fully automatic Bottle and Jar Labeler
Weeks fully automatic straight line front and back Labeler
World and Ermold semi-automatic Bottler and Jar Labeler



World Fully Automatic Rotary Labelling Machine, directly motor driven

COPPER COATING AND POLISHING PANS
With and without steam coils and ribs 24", 30", 36" and 42" diameters

PACKAGING AND CARTONING EQUIPMENT
Including cartoning units, filling and wrapping machines—all types, makes and sizes in stock

EQUIPMENT WANTED
WE PAY CASH FOR SINGLE MACHINES OR ENTIRE PLANTS

Send for latest catalog of our complete stock of equipment

UNION STANDARD EQUIPMENT CO.

318-322 Lafayette St.
New York, N. Y.

GUARANTEED! *Rebuilt Equipment*

BOTTLING EQUIPMENT

LABELERS
2—Ermold 6-wide Automatic
4—World Rotary Automatic
1—O & J Duplex Automatic
2—O & J Simplex Automatic
1—Liquid Semi-Automatic
2—World Improved Semi-Automatic
2—Ermold Improved Semi-Automatic
2—World Jr. Semi-Automatic

FILLERS
2—U. S. Bottlers 5-spout Vacuum
2—Haller 18-spout Automatic
3—Bishop & Babcock 34-spout Automatic
1—Liquid 40-spout Automatic
2—Liquid 32-spout Automatic

CAPPERS
1—Resina Single-Head Automatic
2—Pneumatic Scale of 4-head Automatic
1—Consolidated Packaging Co. Automatic

CROWNERS (for 26 mm. crown closures)
1—CC&S Jumbo Model E 7-Head Automatic
2—CC&S Jumbo Model D 7-Head Automatic
1—Adriance 805 Duplex Automatic
1—Kendall Jr. Single-Head Automatic
2—CC&S Semi-Automatic
2—Adriance 804A Semi-Automatic
1—Modern Bond Semi-Automatic

WASHERS
1—Meyer Dumore Qt. 4-wide, 3-cmpt.
1—Meyer Dumore Qt. 8-wide, 1-cmpt.
1—Meyer Dumore Pt. 8-wide, 3-cmpt.
1—Liquid Superkleen Qt. 8-wide, 3-cmpt.
1—Liquid Superkleen Qt. 8-wide, 3 cmpt. (2 floor)
1—Liquid Superkleen Qt. 8-wide, 2-cmps.

PASTEURIZERS
4—Liquid Basket style, capacities 12, 15, 20 and 30 bbls. per hour
2—Barry-Wehmiller Basket Style, 20 and 40 bbls. per hour
1—Loew Midget Tray Style
1—Loew New Era Truck Style

TANKS
1—100 gal. Nickel lined water jacketed, agitator
3—200-gallon Vertical Pfaudler Jacketed Agitator
3—250-gallon Horizontal Pfaudler Agitator
2—300-gallon Vertical Glascote Jacketed Agitator
2—1200-gallon Nickel Storage
22—3000-12000 gallon Horizontal Pfaudler Storage
2—4400 gallon Jacketed Pfaudler Agitator

FILLERS
1—Ayars #2 Automatic
1—Elgin 6-spout Automatic Plunger Type

FILTERS
2—Ertel 12" Disc Filters
1—Kiefer 12" Disc Filters
1—Shriver 12" C., p. & f.
1—Sperry 42" R.G.C. 35 plate, open delivery, C.I. solid recovery, type 413 Press
1—Sperry 30° R.C.G., 40 plate, open delivery, C.I., Type 31 Press
2—Sweetlands #7 and #10

MISCELLANEOUS
1—4 x 4 Frick Self Contained Ammonia Compressor
3—80 qt. Hobart Mixers
200'-1½" 4-ply hose
2—Langsenkamp Copper Kook More Heating Coils

Kettles, Tanks, Agitators, Thermometers, Heating Coils, Ammonia Compressors, etc.

WE WILL BUY YOUR SURPLUS EQUIPMENT

CHAS. S. JACOBOWITZ COMPANY
1432 NIAGARA ST. Phone LIncoln 3116 BUFFALO, N. Y.
SERVING AMERICAN INDUSTRY FOR OVER 25 YEARS

FOR SALE

300'—1½" White Beer Hose with Fittings
1—2 Spout Piston Filler for Meat Sauce
10—Pfaudler Glass - Lined Sectional Tanks, 750-19,000 Gals. Capacity.
3—Kiefer and U.S. Rotary Rinsers
30—Steel Horizontal Welded One Piece Storage Tanks, 4650-9300 Gals.
97'—9" Screw Conveyor, Wood Housing
1—120' Bucket Elevator, 8" Belt, 7" Wide x 4" Deep Buckets, Wood Housing
6—Day Dry Powder Mixers, 100-1200#
20—Copper and Cast Iron Kettles, Jacketed and Unjacketed, 20-525 Gals.
15—Copper Tanks, 2000-8000 Gals. Capacity 3/16" and ¼" thick
1—39" Dia. Copper Jacketed Vac. Pan
1—World Automatic Rotary Labeler
1—72" Cast Iron Distillation Column
1—14" Copper Rectifying Column
3—Cast Iron Ammonia Stills, 30", 54"
25—Wood Tanks, Set Up, 2000-7000 Gals.
43—100 Gal. Galvanized Spice Hoppers
1—40' Long Belt Conveyor Table
3—Double Pipe Ammonia Coolers
1—Standard Knapp Automatic Case Sealer
2—Permutit Water Systems
2—Ermold 6-wide Labelers
Other Items for Packaging & Processing.
Write for stock list of available equipment.

PERRY EQUIPMENT & SUPPLY CO.
1515 W. Thompson St. Phila., Pa.

FOR SALE

Triangle Model "U" Bag Filler.
Hayssen Cellophane Box Wrapper.
Schutz O'Neill Dustless Sugar Pulverizer No. 3, No. 0 and 16" Limited.
24" Pebble Mill, belt drive.
1 ton York, 1 ton Lipman, 3 ton Frick, 5 ton Jurick and 7½ ton Lipman Self-contained Refrigerating Units.
Steam Jacketed Copper Kettles, 15 gallon to 350 gallon capacity.
Dean Glucose Pump Steam Driven.
Tabor 3" Glucose Pump, motor driven.
Read 80 qt., Hobart 80 qt., Century 30 qt., and Read 12 qt. Vertical Mixers.

SAVAGE BROS. CO.
2638-46 Gladys Avenue Chicago

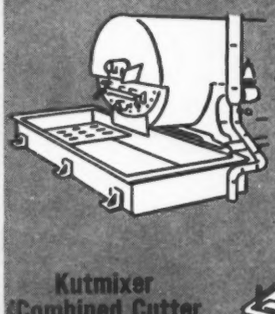
Hottmann Machines help feed the World

3½ Billion Pounds of Meat for Our Allies

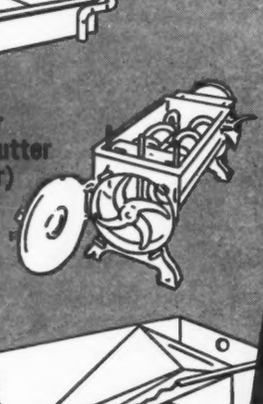
And that is only about 15% of the estimated total required this year to feed our Fighting Men, our Allies and our Civilian population. Truly the U. S. is helping feed the world!

Proper cutting and mixing, important steps in the preparation of many meat products, are the functions of Hottmann Mixers. Many of the machines we built years ago are still doing their bit in war production, efficiently and economically . . . all are helping produce foods that are as essential in the war effort as guns and ammunition.

Hottmann plant facilities are being utilized 100% in war work, but Hottmann experience and knowledge in the design of cutting and mixing equipment are still available. Perhaps we can help you in planning to meet post-war conditions. Consultation is invited.



Fat Melters and Percolators



Kutmixer (Combined Cutter and Mixer)

Improved Catch Basin

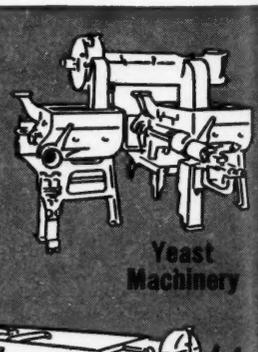
Now is the Time to Work Out Tomorrow's Mixing Problems

New problems in manufacture and new methods for more efficient and more economical production are certain in an America which will be obliged to feed many more millions of people than ever before in the post-war years.

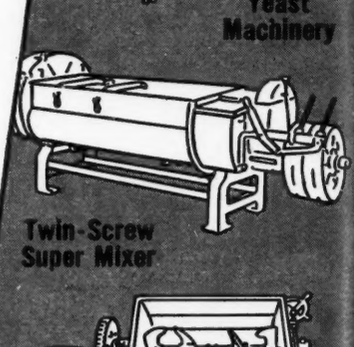
Let us help you plan, now, to meet these problems. Consultation is invited.

PUT YOUR MIXING PROBLEMS UP TO

HOTTMANN



Yeast Machinery



Twin-Screw Super Mixer

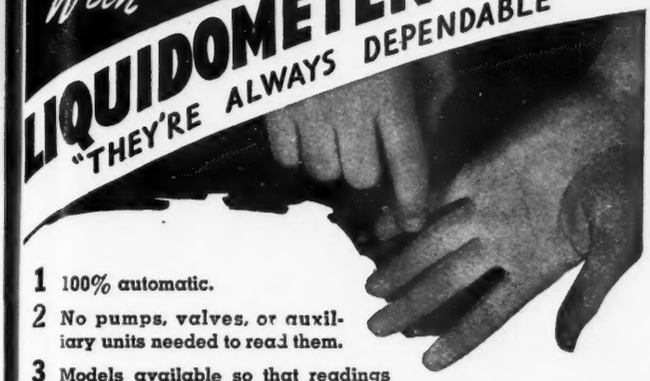
Mixer, interior view

THE HOTTMANN MACHINE COMPANY

3325-47 East Allen Street • Philadelphia, Penna.

5 Reasons Why We Measure Our Valuable Stored Liquids With LIQUIDOMETER Tank Gauges

"THEY'RE ALWAYS DEPENDABLE"



1 100% automatic.

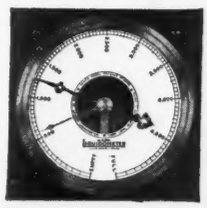
2 No pumps, valves, or auxiliary units needed to read them.

3 Models available so that readings can be taken remotely from or directly at the tank.

4 Accuracy unaffected by specific gravity of tank liquid.

5 Approved for gauging hazardous liquids by Underwriters' Laboratories and other similar groups.

Write for complete details



THE LIQUIDOMETER CORP.

38-14 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

RYERSON CERTIFIED STEELS

Prompt Shipment from 10 Strategically-Located Steel-Service Plants... Principal products include—Alloy Steels, Tool Steels, Stainless Steel, Hot Rolled Bars, Hoops and Bands, Beams and Heavy Structurals, Channels, Angles, Tees and Zees, Plates, Sheets, Cold Finished Shafting and Screw Stock, Strip Steel, Flat Wire, Boiler Tubes and Fittings, Mechanical Tubing, Rivets, Bolts, Nuts, Washers, etc. Write for Stock List. Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Detroit, Buffalo, Cincinnati, Cleveland, Boston, Philadelphia, Jersey City.

INDEX TO ADVERTISERS

- Alloy Steel Products Co., Inc. 18
- American Can Co. 42
- American Monorail Co. 102
- Anchor Hocking Glass Corp. 157
- Armstrong, Inc., C. M. 128
- Armstrong Cork Co. 75, 76
- Baker-Raulang Co. 131
- Bemis Bro. Bag Co. 36
- Bradway Chocolate Co. 162
- Bridges-Wilson Corp. 27
- Brill Equipment Corp. 161
- Brooklyn & Jersey City Warehouses 130
- Brown Instrument Co. 140-141
- Buell Engineering Co. 133
- Burkhard, Inc., Thos. 162
- Calcium Chloride Association 16
- Callahan & Co., A. P. 130
- Carrier Corp. 166
- Celotex Corp. 148
- Century Electric Co. 14
- Chain Belt Co. 35
- Cleaver-Brooks Co. 139
- Cochrane Corp. 156
- Collateral Discount Corp. 160
- Consolidated Products Co., Inc. 162
- Cork Import Corp. 136
- Corn Products Sales Co. 122
- Corning Glass Works 28-29
- Crocker-Wheeler Electric Mfg. Co. 11
- Crown Can Co. 78
- Cuno Engineering Corp. 37
- Cyclone Fence Co. 144
- Damrow Bros. Co. 145
- Darnell Corp. Ltd. 121
- Diamond Crystal Salt Co. 111
- Distillation Products, Inc. 126
- Diversey Corp., The 87
- Dodge & Olcott Co. 137
- Douthitt Corp. 147
- Dow Chemical Co. 32
- Du Pont de Nemours & Co Inc., E.I. (Cellophane) 34
- Economic Machinery Co. 104
- Electro Metallurgical Co. 150
- Eppenbach, Inc. 100
- Exact Weight Scale Co. 158
- Fairbanks, Morse & Co 94
- Ferry Co., J. D. 131
- Filtrine Mfg. Co. 109
- First Machinery Corp. 161
- Food Research Laboratories, Inc. 120
- Frederick Iron & Steel Co. 152
- Frick Co. 82
- Friel, S.E.W. 162
- Fuller Brush Co. 160
- Gales, George 162
- Gardner-Denver Co. 12
- Gardner-Richardson Co. 24
- Gelb & Sons, Inc., R. 162
- General Electric Co. 8-9, 40
- General Motors Truck Co. 142
- Greeff & Co., R. W. 130
- Greer Co., J. W. 23
- Gruendler Crusher Co. 154
- Gump Co., B.F. 109
- Heekin Can Co. ..... Third Cover
- Hersey Mfg. Co. 39
- Hinde & Dauch 106
- Hoffman-LaRoche, Inc. 118
- Hottman Machine Co. 164
- Howes Co., Inc., S. 137
- Industrial Air Co. 114
- Ingersoll-Rand 31
- Inland Steel Container Co. 22
- International Nickel Co. 13
- Island Equipment & Supply Co. 162
- Jacobowitz Co., Chas. S. 163
- Jagenburg, E. R. 162
- Jamison Cold Storage Door Co. 90
- Jeffrey Mfg. Co. 110
- Johns-Manville Corp. 154
- Johnson & Son Inc., S. C. 143
- Kalamazoo Vegetable Parchment Co. 20
- Kehoe Machinery Corp., Lester 162
- Kerby Saunders, Inc. 137
- Koven & Bros., Inc., L. O. 158
- Kuhns Bros. Co. 142
- Lancaster, Allwine and Rommel 130
- LaPorte-Mat & Mfg. Co. 148
- Lee Metal Products Co., Inc. 152
- Leeds & Northrup Co. 4
- Link-Belt Co. 7
- Liquidometer Corp. 165
- Loeb Equipment Supply Co. 162
- Machinery & Equipment Corp. 162
- Magnus, Mabee & Reynard, Inc. 124
- Master Electric Co. 25
- Mearl Corp. 160
- Mears-Kane-Ofeldt, Inc. 115
- Menasha Products Co. 138
- Merck & Co., Inc. 127
- Meyercord Co. 145
- Monsanto Chemical Co. 132
- Mundet Cork Corp. 97
- Nash Engineering Co. 73
- National Can Corp. 134-135
- National Technical Laboratories 103
- Niagara Blower Corp. 128
- Nutritional Research Associates, Inc. 130
- Oakite Products, Inc. 83
- Orr & Sembower, Inc. 144
- Package Machinery Co. 81
- Packaging Exposition & Conference 108
- Paterson Parchment Paper Co. 98
- Perry Equipment & Supply Co. 163
- Pfaudler Co. 146
- Pfizer & Co., Inc., Chas. 125
- Philadelphia Quartz Co. 113
- Pittsburgh Lectrodryer Corp. 10
- Pomona Pump Co. 21
- Premier Mill Corp. 152
- Proctor & Schwartz, Inc. 154
- Pulverizing Machinery Co. 148
- Purity Drug Co. 162
- Quaker City Cold Storage Co. 130
- Republic Steel Corp. 41
- Rhinelander Paper Co. 19
- Robins & Co., Inc., A.K. 130
- Robinson Bros. 86
- Robinson Mfg. Co. 84
- Rossotti Lithographing Co., Inc. 77
- Ryerson & Son, Inc., J. T. 165
- Safety Car Heating & Lighting Co., Inc. 112
- St. Regis Paper Co. 5
- Sarco Co. 160
- Savage Bros. 163
- Seedburo Equipment Co. 105
- Sethness Products Co. 130
- Snell, Inc., Foster D. 130
- Standard Brands, Inc. 38
- Standard Conveyor Corp. 89
- Standard Oil Co. (Indiana) 153
- Stein Hall & Co., Inc. 130
- Stokes Machine Co., F. J. 151
- Stokes & Smith Co. 136
- Taylor Instrument Cos. 33
- Tenney Engineering, Inc. 115
- Texas Co. ..... Fourth Cover
- Timken Roller Bearing Co. 6
- Towmotor Co. 101
- Triangle Package Machinery Co. 26
- Tri-Clover Machinery Co. 96
- Twitchell, Inc., E. W. 88
- Union Bag & Paper Corp. ..... Second Cover
- Union Carbide & Carbon Corp. 150
- Union Standard Equipment Co. 162, 163
- U. S. Envelope Co. 30
- U. S. Gutta Percha Paint Co. 15
- U. S. Testing Co. 117
- Victor Chemical Works 129
- Viking Pump Co. 92
- Vilter Mfg. Co. 116
- Viobin Corp. 130
- Walworth Co. 155
- Wheelco Instruments Co. 91
- Worthington Pump & Mchy. Corp. 85
- Wright's Automatic Mchy. Co. 159
- Yarnall-Waring Co. 17
- York Ice Machinery Corp. 149

● For further detailed information regarding this company's products see the 1943 FOOD INDUSTRIES CATALOG & DIRECTORY

Materials for the Food Manufacture—130

Professional Services—130

Storage, Frozen Foods—130

Where To Buy—130

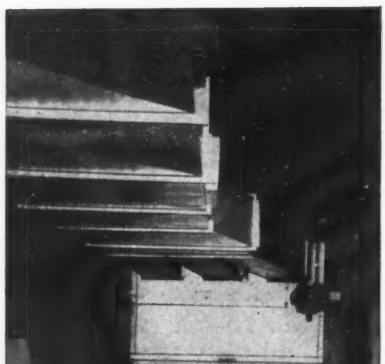
SEARCHLIGHT SECTION
Classified Advertising

BUSINESS OPPORTUNITIES 160
EMPLOYMENT 160
SELLING OPPORTUNITIES 160
USED EQUIPMENT 160-163
WANTED TO PURCHASE 162

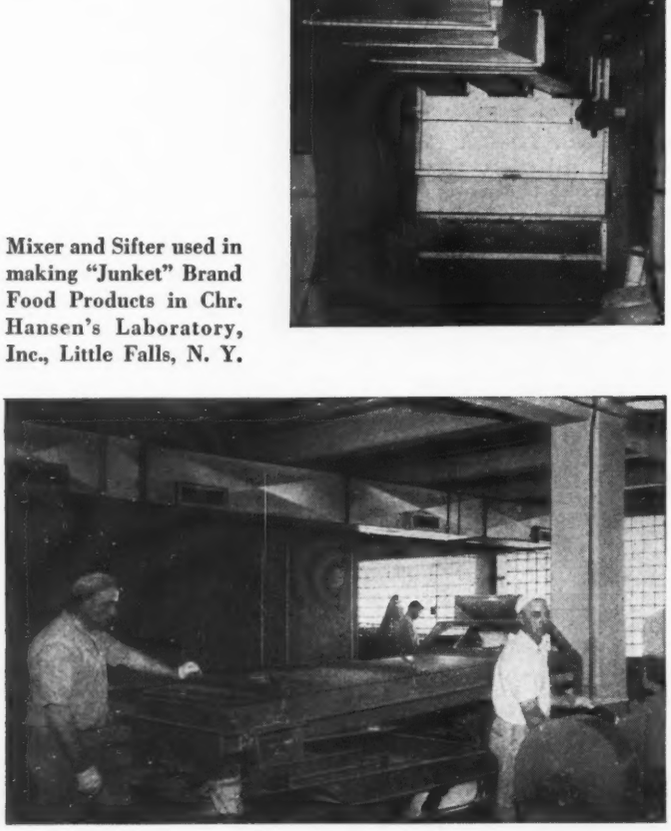
Hygroscopic powders now flow freely for weighing and packaging thanks to humidity control made possible by conditioned air.

Humidity control solves production problems for "THE 'JUNKET' FOLKS"

One of the air conditioned bunkers where materials for "Junket" Brand Food Products are kept in cold storage.



Mixer and Sifter used in making "Junket" Brand Food Products in Chr. Hansen's Laboratory, Inc., Little Falls, N. Y.



CARRIER air conditioning and refrigeration equipment installed in the modern 4-story glass brick plant of Chr. Hansen's Laboratory, Inc., Little Falls, N. Y. maintains an average relative humidity of 45% to 48% and room temperature of 78°. The air is washed and cooled during the night, using 53°F. deep well water and taking in as much cool outside air as possible; then during the day changing over to mechanical refrigeration by starting the compressors and using the cooling water over and over.

The conditioned air eliminates production difficulties in drying, weighing and packaging the hygroscopic powders manufactured by "The Junket Folks". Another benefit of the air conditioned rooms is more comfortable working conditions for the employees. There are no drafts because air flow from the ducts is diverted.

Today, Carrier is concentrating all its production on war work. When Victory is won the developments in air conditioning and refrigeration equipment resulting from our war experience—and there are many of them—will be available for peacetime application. CARRIER CORPORATION, SYRACUSE, N. Y.

This most coveted honor, the Army-Navy "E", was awarded to Carrier Corporation for continued excellence in war production.

Carrier

AIR CONDITIONING
REFRIGERATION

Someday You'll Want A Finer Metal Package

ALMOST before you are aware of it will come the transition back to normal, peaceful competition. Today, batteries of Heekin high speed lithograph presses are working on metal containers for packaging products needed by this nation for defense. If you have such a product, we can be of service to you. If you have not—remember Heekin Research Laboratories continue their efforts to improve lithography on metal. Someday you'll want a finer metal package . . . when that day comes remember us. In the meantime—Look Ahead.

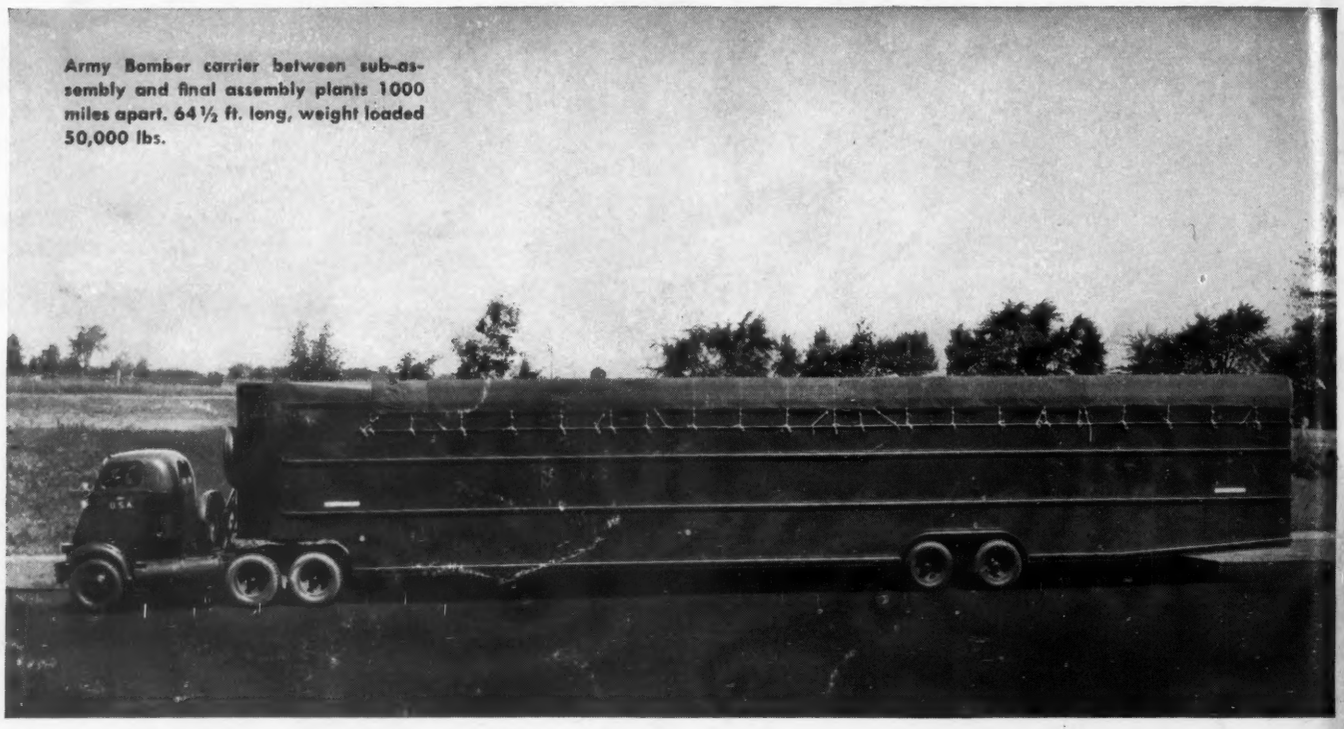
THE HEEKIN CAN CO., CINCINNATI, OHIO

HEEKIN CANS

Lithographed

WITH HARMONIZED COLORS

ENGINES "LIKE NEW" at each Oil Change!



Army Bomber carrier between sub-assembly and final assembly plants 1000 miles apart. 64½ ft. long, weight loaded 50,000 lbs.

YOU will get thousands of extra miles of service between overhauls when you lubricate your heavy-duty engines with *Texaco D-303 Motor Oil.*

Texaco D-303 possesses not only detergency, but *dispersion* properties. Detergency means cleaning engines of old deposits. Dispersion means that carbon and other deposit-forming materials do *not* settle out in the engine, but remain in suspension, draining away when the oil is changed, thus keeping screens and oil-ways clear.

Texaco D-303 also possesses high film-strength, assuring protection against scuffing of rings and cylinders . . . also protects modern precision-type alloy bearings. Its use assures full power and substantial fuel economy.

For quieter-running longer-lasting transmission and differential gears, use *Texaco Thuban.*

So effective have Texaco Lubricants proved that they are definitely preferred in many important fields, a few of which are listed in the panel.

These Texaco users enjoy many benefits that can be yours. A Texaco Automotive Engineer will gladly cooperate in the selection of the most suitable lubricants for your equipment. Just phone the nearest of more than 2300 Texaco distributing points in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York, N. Y.

THEY PREFER TEXACO

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

★ More buses, more bus lines and more bus-miles are lubricated and fueled with Texaco than with any other brand.

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

★ More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.

TEXACO REG. T. M.

TEXACO Lubricants and Fuels

FOR ALL TRUCKING EQUIPMENT

TUNE IN FRED ALLEN EVERY SUNDAY NIGHT—CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY